Requirements on Marking of Goods and Accompanying Information for Purchased Production Parts

(**MAT-Label, Version 2.6**)

Automotive Supplier Standard

MAT Label

Marking of Goods

BE COM

BOSCH

cms electronics

Continental

HELLA

SIEMENS

zollner

Content:

I. Change History

Version 2.4   First official release

Version 2.5   2.4 errata version. Formal corrections in the chapters "List of Abbreviations" and "Related Documents". New sample pictures. Request to place a code on shipping note removed (moved to company-specific specification).

Version 2.6   Redactional update. New samples in Annex A.

II. List of Figures:

III. List of Abbreviations:

DC   –   Automatic data capture

ANSI   –   American National Standards Institute

BC128   –   Bar Code according to ISO/IEC 15417 (Abbrev. = BC 128)

BOM   –   Bill of material

CCD   –   Charge-coupled device

DIN   –   Deutsches Institut für Normung e.V.
                (German Institute for standardization)

DMC   –   Data Matrix Code

DUNS   –   Data Universal Numbering System

EC   –   European Commission

ECC   –   Error Correction Code

ECL   –   Error Correction Level (same as ECC)

ESDS   –   Electrostatic Sensitive Devices

GTL   –   Global Transport Label

IEC   –   International Electro Technical Commission

IPC	–	Association Connecting Electronics Industries – formerly known as Institute for Interconnecting and Packaging Electronic Circuits
ISO	–	International Organization for Standardization
JEDEC	–	Solid State Technology Association - formerly known as Joint Electron Device Engineering Council
LED	–	Light Emitting Diode
ODETTE	–	Organization for Data Exchange by Tele Transmission in Europe
RoHS	–	Restriction of the use of certain hazardous substances in electrical and electronic equipment
VDA	–	Verband der Automobilindustrie e.V. (German Association of the Automotive Industry)

IV.   Related Documents see Annex B

V.   List of terms

Consumables	Material of the BOM (bill of material) which is used in the product or process beside the electrical and mechanical components like solder paste, glue, lacquer, sealing material
Consignment Advise	Document which verifies the instruction to advise the consignment
Transport Authorization	Document which verifies the authorization to transport the consignment.
Unit load	Transport unit which consists of smallest package units

1   Purpose and Scope:

The automotive industry places increasing demands on traceability along the whole supply chain. To ensure this traceability, material flow and information flow from suppliers to customers have to be aligned.

This can be achieved by a unique material label on the smallest package unit containing a clearly defined set of traceability information. Up to now, there is no common industry standard for such a label.

The MAT-Label is a complement to existing labels such as VDA 4902, Odette and GTL. These existing logistics labels are taken into account and referenced.

2   Validity and Transition Period

The following document is valid for the companies BECOM Electronics GmbH, Robert Bosch GMBH - Automotive Electronics, Continental Automotive, cms electronics gmbh, Hella KGaA Hueck & Co., Siemens AG (I DT MC), and Zollner Elektronik AG and replaces former versions.

It can also be applied by other companies. Upon further notice existing company specific labeling specifications are valid.

3   Release process for the Data Matrix Code (DMC) on MAT-Label[1]

If the MAT-Label (package label of a supplier) was approved by a customer[2] plant and the approval is based on the requirements listed in the following, then the approval is also valid for all other plants of the customer which request a MAT-Label.

The label has to be used immediately for all receiving plants which request the label as soon as they have b*een* approved.

One sample has to be sent from each logistic center of the supplier to the releasing plant of the customer. The approval can be differentiated in a general and a plant specific release.

The general approval is valid for all customer plants which will use a MAT-Label for packaging identification. Plant specific data contents have to be verified by each individual plant (e.g. data field "Add. Part Info", respective Supplier ID).

The data content of customer defined fields can be different from plant to plant.

The original approval of the MAT-Label has to be kept carefully and presented upon request.

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[1] MAT-Label as single label is always referring to the smallest packaging unit

[2] Customer refers to the respective company applying this standard, e.g. BECOM Electronics GmbH, Robert Bosch GMBH - Automotive Electronics, Continental Automotive, cms electronics gmbh, Hella KGaA Hueck & Co., Siemens AG (I DT MC) and Zollner Elektronik AG or other.

4 Marking of a Unit Load

4.1 Part Packaging (smallest packaging unit)

The smallest package does not contain any additional sub-packaging usually. The MAT-Label (single label) has to be placed on each smallest packaging unit.


```
                 Part Number:    A2C5302552200          Index:
                 Quantity:       2000                   MS-Level: 2
                 Ordering Code: LSYT67B-S2T2-1-0+T1U2-35-0-30-R18-Z
                 Add.Info: 20100U10500
                 1. Batch: 1006376150
                 2. Batch:
                 Supplier: Sample & Co
Multi LED
Date Code:       20140411              Expiry Date: 20160324
Supplier-ID:     8301596               Package-ID: S415514224701
Purchase Order:  5500003734            Shipping N.: 56183183
Man. Part-No.:   Q65110A0272
Man. Location:   MYS-PENANG                            RoHS
Supplier-Data:   Pack: R18 T DEMY 016 B_P029          2011/65/EU
```

Figure: 1 Example of a MAT-Label

| (1) Receiver
**Continental Automotive Hungary
Ltd. Napmátka u. 6. 1106 Budapest** | (2) Dock / Gate
- - | (3) Shipping Note (16K): 2014-53006 |
| | | Purchase Order Number (K): 6100068826 |

	(8) Part Number (P): **A2C0005836000**	Add.Info (20P): Expiry Date (14D): 20150306 MS-Level (Z): N
	(9) Quantity (Q) **400**	(10) Part Name: Pressure Sensor
		(11) Man. Part No.: (1P): 52ZIO5-31..78 Ordering Code (31P): 52ZIO5-31..78 Man. Loc.: (10V): MEX-TORREON
(12) Packaging Unit - Reference: Supplier-ID (V): **354325** Package-ID (3S): **S406512024201** **Single Label**		(13) Date Code (6D): 20140306	(14) Index (2P):
(15) Supplier: Sample & Co. Supplier-Data (1Z): Warehouse 4, Gate 16A	(16) Batch Number: 1. Batch (1T): 5300621 2. Batch (2T):	(Special mark) **RoHS**

Figure: 2 MAT-Label for KLT (returnable container) as single label (not to scale, original 210 x 74 mm)

4.2 Marking of Dry Pack Packaging

In case of a "Dry Pack" the protective packaging or the protective bag enclose the smallest package unit. Each Dry Pack packaging has to get one MAT-Label.

Figure: 3 Reel in Dry Pack

Per Dry Pack, only one unit (e.g. reel) inside the protective packaging is allowed.

Other definitions pertaining to part packaging have to be coordinated with the particular receiving plant depending on the Customer Part Number / drawing number.

For Dry Packs the MAT-Label has to be peel-able (removable) in one piece without partial damage.

If the MAT-Label has already been applied to the reel inside of the Dry Pack then the type of label has to be permanent on reel and Dry Pack (e.g. contract manufacturing). Both MAT-Labels have to be identical including its Package-ID.

4.3   Marking of a Unit Load as the smallest Packaging Unit

If the unit load (shipping container) should at the same time represent the smallest package unit, then the approval of the particular receiving plant has to be requested in general depending on the Customer Part Number / drawing number.

If the approval is given, then a MAT-Label in single version will become necessary, too. Because this unit load stands for the defined "smallest" packaging unit (even it is a large one).

The layout of the MAT-Label has to be selected in such a way that the Customer Part Number and amount can also clearly be read from distance.

If large fonts on MAT-Label are not feasible, an additional ODETTE-Label (also VDA or GALIA) will become necessary. In this case, the MAT-Label has to be applied on the ODETTE-Label.

5   Additional Requirements:

The following marking for RoHS compliance can also become necessary in addition.

If the part complies with current valid RoHS compliance a RoHS-Logo shall be printed on the MAT-Label.

RoHS
2011/65/EU

Figure: 4 Example for a symbol for RoHS compliance

If the printing of the RoHS symbol is not possible the marking with letters like "**RoHS**" is allowed alternatively.

Samples for RoHS symbology:

Either: or:

6   MAT-Label Requirements:

This chapter describes the universally valid aspects of the MAT-Label:

- Label size and layout (recommendation for the print-out style sheet)

- Attachment on the smallest package unit / attachment location

- Information Content

- Plain text and machine-readable codes

- Data syntax and print parameters

6.1   Size and Layout:

The MAT-Label consists of black printing on white label. Examples of valid layouts are defined and listed in the Appendix A.

The size of the MAT-Label can be chosen by the supplier considering the size of the smallest package unit. Recommendations are shown in Appendix A.

- Compare the planned size of the MAT-Label with the smallest free space on the part packaging (smallest packaging unit), to avoid using too large labels.

- To ensure to have enough free space for the code, its quiet zone and for the plain text, create a layout with maximum filled data fields.

- The recommendations in Appendix A shall be the basis template for the own created layout.

   For customer fields consider the maximum field length as specified. For own (supplier) fields, consider the maximum field length within your company now and in future.

   Example: If the Manufacturer Part Number has maximum 10 characters in any cases, than it is not mandatory to reserve place for 35 characters.

- A border line around the label is not allowed. The pictures (better: the border lines) in Appendix A are showing the outline of the label only.

- Sufficient free area around the printing (not to close to the edges) has to be maintained. Consider to possible paper handling and printer tolerances.

- The MAT-Label samples in Appendix A are shown with real data. Spaces between data fields can occur, because the data does not occupy the maximum field length.

- **The customer part number and the quantity have to be highlighted against the other information by using larger or bold type.**

- All data fields have to be adjusted in that way, that there is enough space among each field for the maximum defined data length (in particular 1. Batch-No. and 2. Batch-No.).

6.2   Attachment, Attachment Position

The supplier has to make sure, that the MAT-Label is easily and completely readable, does not cover up any other supplier-created data and is safely positioned on the packaging and against damages during transportation and opening at customer.

- The attachment with wire is not allowed.

- The MAT-Label has to be attached permanently on the smallest package unit where applicable and peel-able on Dry Packs, see Chapter 4.2

- Reusable Containers (Durable Systems)
  The MAT-Label shall not be attached permanently and over the entire surface. The attachment of labels with bonding dots is permissible. The label and its attachment (bonding dots) have to be removable without residue.

7   Information Content

The following table lists the data fields which the supplier has to provide on the MAT-Label. It defines the format, length and the data identifier. The data fields are explained in detail afterwards.

The Data Matrix Code on the MAT-Label has to contain all data fields including its data identifier in the order represented by the column number.

It is strictly distinguished between the manufacturer, who actually produces the part and the supplier, who delivers the part to the customer.

Please note that the data content of respective fields e.g. customer part number can be different from plant to plant.

Nr.	Data Field	Definition / Description	Data Identifier	Length	Format [3]	Examples	Machine-readable Code Data Matrix Code ECC200	Printed Text on the label
					Label Information			
1.	Label Version	The revision level is a fixed entry and serves the recognition of the label or its version.	12S	4	N ("0002")	0002 (fixed data)	yes	no
					Part Information			
2.	Customer Part Number [4]	Part number of the customer.	P	Max. 18	A/N	**718.187-04 A2C5321641900**	yes	yes **(highlighted)**
3.	Manufacturer Part Number	Internal manufacturer part number.	1P	Max. 35	A/N	SL105C103MAA-S	yes	yes
4.	Ordering Code [4]	Code for the part which non-ambiguously can be used for ordering it. Compared to the "Manufacturer Part Number", the Ordering Code may contain more information, e.g. Software Version in case of Microcontrollers or package form.	31P	Max. 35	A/N	SC441427CFNR2 A2C53216419/02	yes	yes
5.	Part Description (Part Name)	Clear-text description of the part (or part name), so that persons who are not familiar with the manufacturer's naming convention can understand what kind of component this is	-	Max. 30	A/N	10 nF / 50 V / Ker W204KLA	no	yes
6.	Manufacturer Number	Explicit identification for the manufacturer, e.g. DUNS-Nr. or mutual agreed manufacturer number.	12V	Max. 13	A/N	123456789	yes	no
7.	Manufacturer Location	Naming the manufacturing location / locations	10V	Max. 20	A/N	DEU-BERLIN CHN-BEIJING	yes	yes
8.	Revision Level / Index [4]	Revision status of the part.	2P	Max. 14	A/N	AA 01	yes	yes
9.	Additional Part Information	Used differently by each plant, flexible filled, e.g. brightness of the LEDs.	20P	Max. 30	A/N		yes	yes
					More Part Information			
10.	Date of Manufacturing	Date of manufacturing is related to the last manufacturing process	6D	8	YYYYMMDD	20080330	yes	yes
11.	Expiration Date	The Expiration Date of the part (defined by the manufacturer (depending on production date).	14D	8	YYYYMMDD	20081031	yes	yes
12.	RoHS	Indicator for RoHS compliance N: no RoHS Y: RoHS 0: not applicable	30P	1	A/N (upper case)	Y	yes	Logo

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[3] N = numerical, A/N = alphanumerical, D = day, M = month, Y = year

[4] Capital letter formatted analogue to the order

Nr.	Data Field	Definition / Description	Data Identifier	Length	Format [3]	Examples	Machine-Readable Code Data Matrix Code ECC200	Printed Text on the label
13.	MS-Level	Moisture Sensitivity Level according to IPC/JEDEC J-STD-020.	Z	Max. 2	A/N, "N" if not applicable	5	yes	yes
					Logistic and Traceability Information			
14.	Purchase Order Number [4]	Order number assigned by customer to identify a purchasing transaction.	K	Max. 18	A/N	753013	yes	yes
15.	Shipping Note Number	Shipping Note Number of the shipping note and MAT-Label must be the same.	16K	Max. 12	A/N	54003333	yes	yes
16.	Supplier Name (no real data field!)	The Supplier Name.	-	Max. 30			no	yes
17.	Supplier-ID (vendor number) [4]	The vendor number (of the customer) for the supplier. It has to be taken over from the order.	V	Max. 10	A/N	884566	yes	yes
18.	Package-ID	The explicit, unique number per single package. It has to be unique per supplier-id (vendor number) and package. It is always related to the smallest package unit. If possible, chronologically related to the production process (e.g. reel-ID).	3S	13	A/N Capital letter only	S123456789012 (first Byte reserved for specifying single or master)	yes	yes
19.	Quantity	Quantity of the smallest package unit.	Q	Max.18	12ISO3 to be aligned to the right,	1000NAR000 (printed: **1000**) 10KGM020 (printed: **10,02**)	yes	yes **(highlighted)**
20.	Batch Counter	Batch Counter identifies the number of batches (1 or max. 2 batches per reel possible).	20T	1	N	2	yes	no
21.	Batch-No. #1	With this number the supplier has to be able to retroactively provide information about the batch (e.g. volume, production, delivery) A batch identification should be based on same manufacturing conditions. If a manufacturing condition changes, the batch number should be changed, too.	1T	Max. 17	A/N	750160429	yes	yes
22.	Batch-No. #2	Batch number for the second batch - if applicable.	2T	Max. 17	A/N	750160430	yes	yes
					Other			
23.	Supplier Data	Supplier own information that may be used by the supplier.	1Z	Max. 30	A/N		yes	no

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[3] N = numerical, A/N = alphanumerical, D = day, M = month, Y = year
[4] Capital letter formatted analogue to the order

Description to data fields:

7.1 Label Version

The label version is a fixed entry and serves as the recognition of the label and its version. The current label version described in this specification is 2 and the fixed entry of this data field is "0002".

7.2 Customer Part Number

Part number of the customer; the format and design of the customer part number has to be analog to the order.

The customer part number and the quantity have to be highlighted in bold font.

7.3 Manufacturer Part Number

Parts number under which the manufacturer identifies the part and which is used for the release of the part by the customer.

7.4 Ordering Code

The ordering code is a mutually agreed code for the part which unambiguously can be used for ordering it. Compared to the "Manufacturer Part Number", the Ordering Code may contain more information, e.g. SC441427CFNR2, software version in case of microcontrollers, kind of packaging etc.

7.5 Part Description

Description of the ordered part (or part name) using plain text.

7.6 Manufacturer Number

Explicit identification of the manufacturer by DUNS-No or mutually agreed between customer and supplier. It is described in customer appended papers.

7.7 Manufacturing Location

Identification of the manufacturing location (preferred the location of the final test of the component) as mutually defined between supplier and respective customer.

Example: DEU-BERLIN   (in case of only one location in town)
DEU-BERLIN1 ⎱
DEU-BERLIN2 ⎰   *(in case of two locations in town)*

The field with a maximum of 20 digits consists of 3 Characters Country-Code analogue ISO3166-1 ALPHA-3 [3 digits] + „-„ [1 digit] + Plant-Location [required digits] + Plant-Number [0 or 1 digits (if more than 1 plant)]

7.8   Revision Level / Index

Revision level (material revision) of the part, if requested by customer.

7.9   Additional Part Information

This field can be flexibly used for additional information about the part, e.g. for the brightness (binning class) of LEDs. The content of this field has to be mutually agreed between manufacturer (supplier) and the receiving customer plant.

7.10   Date of manufacturing

The date of manufacturing (also called 'Date Code') as defined by the last manufacturing process.

Definition / Date Format:

YYYYMMDD

Example: 20140312   Dots (separators) are not allowed as code content.

7.11   Expiration Date

The Expiration Date of the part is defined by the manufacturer (depending on the production date).

This is the date until this part has to be processed by the customer (stored under the specified conditions).

Definition / Date Format:

YYYYMMDD

Example: 20151231   Dots (separators) are not allowed as code content.

7.12   RoHS

In the 2D-Code, a "Y" means compliance to the current RoHS directives and an "N" means non-compliance.

If RoHS is not applicable, the field entry is "0" (zero).

In case the parts are RoHS compliant, the RoHS symbol has to be printed onto the MAT-Label. If this is not possible, the print of "RoHS" in letters (without symbol or logo) is allowed.

7.13   MS-Level

It is the moisture sensitivity level for parts according to industrial standard IPC/JEDEC J-STD-020. If the part is moisture-sensitive, then the MS-Level has to be entered according to the listed levels in the industrial standard IPC/JEDEC J-STD-020 (see also chapter 4.2).

Moisture Sensitive Level according to JEDEC-J-STD standard:

Moisture Sensitivity Level	Floor Life (out of bag) at factory ambient ≤30 °C/60% RH or as stated
1	Unlimited at ≤30 °C/85% RH
2	1 year
2a	4 weeks
3	168 hours
4	72 hours
5	48 hours
5a	24 hours
6	Mandatory bake before use. After bake, must be reflowed within the time limit specified on the label.
N	Not moisture-sensitive according JEDEC-J-STD standard

7.14 Purchase Order Number

The purchase order number is assigned by the customer to identify a purchasing transaction. It has to be identical to the one on the Shipping Note.

7.15 Shipping Note Number (Delivery Note Number)

Shipping Note Number identifies the shipping. It has to be identical to the one on the Shipping Note. Other names for a Shipping Note are delivery note, packing list, pack list, dispatch note, etc.

7.16 Supplier Name

The supplier name will only be printed as plain text and is not part of the 2D-Code.

7.17 Supplier-ID

The Supplier-ID is the vendor number under which the customer identifies the supplier. The Supplier-ID has to be taken-over from the order.

7.18 Package-ID

The Package-ID is the unique number per smallest package unit of each supplier characterized by Supplier-ID. The Package-ID has to be defined by the supplier and has to be unique world-wide per Supplier-ID. The Package-ID will be used for costumer purposes only to distinguish the package units.

The MAT-Label applies for the smallest package unit (single label) according to definition. Therefore the first Character has to be an "S".

If the MAT-Label is required by customer as master label, the first character has to be an "M".

Example for a Package-ID:

S123456789012

S= Single; M= Master

Per package unit unique number and/or letter combination
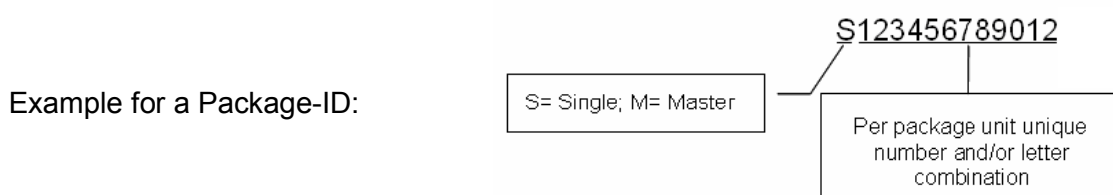
The concatenated data fields Supplier-ID and Package-ID represent the unique trace code at customer for the smallest package unit.

Examples in defined sequence:

<div align="center">

^G_SV884566^G_S3SS123456789012^G_S

@V884566@3SS123456789012@

</div>

7.19 Quantity

The quantity is the number of parts or the amount contained in the package unit.

The format in the 2D-Code is 12ISO3, i.e. maximum 12 significant places and exactly 3 decimal places.

For the significant digits do not use leading zeros. For the decimal places, use always exactly 3 decimal places and fill up with zeros for the case that there are less than 3 decimal places given in the amount.

ISO denotes the identifier for the measuring unit (e.g. pieces, liters, etc.) according to the recommendation No. 20 of WP.4 of the UN/ECE which is generally accepted for the use in Electronic Data Interchange (EDI) and supported e.g. by SAP.

The format used for the printed plain text should be 12,3 and given in the plain text measuring unit instead of the ISO Code. Separators (periods) can be added to make it easier to recognize thousands places.

Separators (dots, periods) are not permitted in the encoded quantity (quantity in code).

If different formats for 2D-Code and printed information is technically not possible, then the quantity has to be printed in the same way as it is contained in the 2D-Code.

Excerpt from the UN/ECE Recommendation 20:

Measured Quantity	Measuring Unit	ISO Code
Number of Articles	Pieces	NAR
Mass	Kg	KGM
Mass	Metric Ton	TNE
Mass	Grams	GRM
Volume	Liters	LTR
Volume	Cubic meters	MTQ
Length	Meters	MTR
Length	Km	KMT

Examples:

Quantity	Printed plain text	In Code
12 Kg	12 Kg	12KGM000
12.03 Kg	12.03 Kg	12KGM030
3000	3000	3000NAR000

7.20 Batch-Counter

The Batch-Counter is the total number of batches in the smallest packaging unit. Maximum two different batches are allowed in one smallest package unit.

Examples:

Package unit includes only one Batch (e.g. Batch-Number: 0105086).

Field name: Data (content):

Batch-Counter:	1
1. Batch-No.:	0105086
2. Batch-No.:	(empty)

Package unit includes two Batches (e.g. Batch-Number 0105086 and 0105087).

Field name: Data (content):

Batch-Counter:	2
1. Batch-No.:	0105086
2. Batch-No.:	0105087

7.21 Batch-No. #1

The data field Batch-No. #1 contains an identification code for the production batch of the part (batch number, lot number, trace code, date code …).

With this number the supplier has to be able to retroactively provide all traceability information about the production batch (e.g. volume, production, delivery, half-finished goods used in the production, production machine(s), operator …).

Batch identification should be based on same manufacturing conditions. If the conditions (machine, half-finished goods, operator …) change, the batch number should also change. Collective batches are not allowed.

7.22 Batch-No. #2

The data field Batch-No. #2 contains an identification code for the second production batch of the part (batch number, lot number …) if it exists in packaging unit.

In case of two batches inside the packaging unit, the value in field Batch-No. #2 must not equal to the value in field Batch-No. #1.

If a second batch exist in packaging unit, as results the value in field Batch-Counter = 2

7.23 Supplier Data

This data field may freely be used by the supplier.

8   Requirements on the 2D- and (if requested) on the 1D-Codes:

8.1   Print Parameters for the Data Matrix Code

• Code Type	DMC (acc. ISO/IEC 16022)
• Failure Correction	ECC 200
• Module width	min 0,25 mm (3 Dot / Mod)
• Code size	maximum of 80 x 80 modules
• Rest zone (quite zone)	min. 4 modules (1 mm for 0,25 mm module width)
• Print density	300 dpi (preferred)

8.2   Additional Barcode on MAT-Label:

Additional Barcodes on the label in the format BC128 might be necessary to be compatible to existing equipment in the plants of the customer.

Therefore the customers describe this requirement with samples in appended papers.

8.3   Label Material Properties

8.3.1   Non-removable label

• Face Material	white, reverse coated, mat
• Adhesive	Permanent adhesive adjusted to the material of the smallest package unit
• Recycling regulations have to be obeyed	

8.3.2 Peel-able label

- Face Material   white, reverse coated, mat

- Adhesive   Removable adhesive adjusted
                                                 to the material of the smallest
                                                 package unit, residue free

- Recycling regulations have to be obeyed

8.4 Data Contents and Data Syntax based on ISO/IEC 15434

8.5 Syntax

According to ISO/IEC 15434 the data matrix code is structured into data fields separated with separators. Make sure that 06 is used as format indicator (part of the format header).

The symbols $^{R}_{S}$, $^{G}_{S}$ and $^{E}O_{T}$ are in accordance to ASCII/ISO 646.

$^{R}_{S}$ is as hexadecimal value **1E**, in decimal **30**

$^{G}_{S}$ is as hexadecimal value **1D**, in decimal **29**

$^{E}O_{T}$ is as hexadecimal value **04**, in decimal **04**

Due to technical compatibility Bosch Automotive Electronics, Hella, Siemens I DT MC and cms electronics are requesting the character " @ " (without quotes) as format header and trailer, data element separator and message trailer ($^{R}_{S}$, $^{G}_{S}$ and $^{E}O_{T}$).

Continental Automotive, Zollner and Becom allow this also as an exemption.

No blanks or line feeds are permissible between the data fields.

8.6 Data Content and Data Identifier

The content of each data field is described by a data identifier. Within each data field, the data identifier precedes the data.

If mutual agreed, blanks are only permissible in the data fields, if they are part of the information content or if they were provided to the supplier as stated in the order.

The previous table (table from page 11 onwards) lists the data, data length, format and data identifiers that have to be encrypted in the code. All fields are mandatory fields.

If all data fields are maximal filled, in total 399 characters are possible in string, including all data identifiers and message header, trailer and data element separators.

All Data Identifiers have to be listed, also in case of an empty data field. Their sequence is defined by table in chapter 7 from page 11 onwards.

Character " @ " as content in a data field is prohibited.

8.7   Description to the requested data syntax

The next sheet illustrates the syntax.

8.7.1   Syntax with $^R S$, $^G S$ and $^E O_T$:

Message and Format-Header, Data Element Separator, Format- and Message-Trailer is in yellow.
Data Identifiers are in green.
Data fields are white.
Data are in bold font.

The syntax looks like:
(string is in one line, below existing line feeds only for illustration in this document)

[)>^{R}s06^{G}s12SLabel-Version^{G}sPCustomer-Part-Number^{G}s1PManufacturer-Partnumber
^{G}s31POrdering-Code^{G}s12VManufacturer-Number^{G}s10VManufacturer-Location
^{G}s2P Index^{G}s20PAdd.Info^{G}s6DDate-of-manufacturing^{G}s14DExpiry-Date
^{G}s30PRoHS^{G}sZMS-Level^{G}sKPurchase-Order-Number^{G}s16KShipping-Note-Number
^{G}sVSupplier-ID^{G}s3SPackage-ID^{G}sQQuantity^{G}s20TBatch-ID^{G}s1T1.Batch^{G}s2T2.Batch
^{G}s1ZSupplier-Data^{R}s^{E}O$_T$

With data it looks like (data sample):

[)>^{R}s06^{G}s12S0002^{G}sP00196508A0^{G}s1PE0151CIT00003
^{G}s31PE0151CIT00003^{G}s12V316111702^{G}s10VJPN-TOKYO
^{G}s2P^{G}s20P^{G}s6D20120323^{G}s14D20130323
^{G}s30PY^{G}sZ5a^{G}sK6100004089^{G}s16K3551354
^{G}sV310734^{G}s3SS000001069425^{G}sQ1200NAR000^{G}s20T1^{G}s1T126A006C^{G}s2T
^{G}s1ZCN-N1^{R}s^{E}O$_T$

8.7.2   Syntax with @ instead of $^R S$, $^G S$ and $^E O_T$:

[)>@06@12SLabel-Version@P Customer-Part-Number@1PManufacturer-Partnumber
@31POrdering-Code@12VManufacturer-Number@10VManufacturer-Location
@2P Index@20PAdd.Info@6DDate-of-manufacturing@14DExpiry-Date
@30PRoHS@ZMS-Level@KPurchase-Order-Number@16KShipping-Note-Number
@VSupplier-ID@3SPackage-ID@QQuantity@20TBatch-ID@1T1.Batch@2T2.Batch
@1ZSupplier-Data@@

With data it looks like (data sample):

[)>@06@12S0002@P00196508A0@1PE0151CIT00003
@31PE0151CIT00003@12V316111702@10VJPN-TOKYO
@2P@20P@6D20120323@14D20130323
@30PY@Z5a@K6100004089@16K3551354
@V310734@3SS000001069425@Q1200NAR000@20T1@1T126A006C@2T
@1ZCN-N1@@

8.8 Description to syntax and to the data content:

Field	Value 1	Value 2	Req	Note	Description
Message Header	[)>^R_S06	[)>@06	Yes	Yes	Syntax based on ISO/IEC15434 with using Data Identifiers for identification of data fields
Data Element Separator	^G_S	@	Yes		New Data Field
Data Identifier	12S	12S	Yes		Data Field shows type of message
Label Version	0002	0002	Yes	That is a fix value.	Following message is based on MAT-Label specification Version 2.x
Data Element Separator	^G_S	@	Yes		New Data Field
Data Identifier	P	P	Yes		Data field for part number assigned by customer
Continental Part Number	00196508A0	00196508A0	Yes		Continental Part number is 00196508A0, based on Continental Automotive order.
Data Element Separator	^G_S	@	Yes		New Data Field
Data Identifier	1P	1P	Yes		Data field for part number assigned by manufacturer of the part.
Manufacturers part no.	E0151CIT00003	E0151CIT00003	Yes		Manufacturer part number is E0151CIT00003
Data Element Separator	^G_S	@	Yes		New Data Field
Data Identifier	31P	31P	Yes		Data field for Ordering Code
Ordering Code	E0151CIT00003	E0151CIT00003	Yes		Ordering Code is E0151CIT00003
Data Element Separator	^G_S	@	Yes		New Data Field
Data Identifier	12V	12V	Yes		Data field for manufacturer number
Manufacturer Number	316111702	316111702	Yes	Continental CVM or DUNS possible.	Manufacturer number is 316111702 (basically the CVM-Number, this is a DUNS-Number)
Data Element Separator	^G_S	@	Yes		New Data Field
Data Identifier	10V	10V	Yes		Data field for manufacturer location
Manufacturers Location	JPN-TOKYO	JPN-TOKYO	Yes	ntry code is mandatory. Location can be abbrevia	Manufacturer location was in Japan, Tokyo
Data Element Separator	^G_S	@	Yes		New Data Field
Data Identifier	2P	2P	Yes		Data field for material revision
Material Revision			Depends	Can be empty, if it is not requested.	No material revision used in order in this case. If a material revision is requested, it shall be stated in this field
Data Element Separator	^G_S	@	Yes		New Data Field
Data Identifier	20P	20P	Yes		Data field for additional part information
Additional Part Info.			Depends	Is in use for LED or in exception.	No additional part information. Add. Info is in use for LED or in other exceptional cases. Basically it is empty.
Data Element Separator	^G_S	@	Yes		New Data Field
Data Identifier	6D	6D	Yes		Data field for date of manufaturing
Date of manufacturing	20120323	20120323	Yes		Date of manufacturing was in March 23th, 2012
Data Element Separator	^G_S	@	Yes		New Data Field
Data Identifier	14D	14D	Yes		Data field for expiration date
Expiration date	20130323	20130323	Yes		Component will be expired on March 23th, 2013
Data Element Separator	^G_S	@	Yes		New Data Field
Data Identifier	30P	30P	Yes		Data field for RoHS compliance
RoHS compliement.	N	N	Yes	Possible content is Y, N or 0 (zero)	Component does not comply to RoHS directive
Data Element Separator	^G_S	@	Yes		New Data Field
Data Identifier	Z	Z	Yes		Data field for moisture senstive level according to IPC/JEDEC J-STD 020.x
Moisture Level	5a	5a	Yes	Possible content is 1, 2, 2a, 3, 4, 5, 5a, 6 or N	Moisture Level is 5a based on IPC/JEDEC standard.
Data Element Separator	^G_S	@	Yes		New Data Field
Data Identifier	K	K	Yes		Data field for purchase order number (assigned by customer)
Continental Purchase ..	6100004089	6100004089	Yes	Exception rule: 0 (zero) is allowed.	Purchase order number assigned by Continental is 6100004089. Number of SAP delivery schedule.
Data Element Separator	^G_S	@	Yes		New Data Field
Data Identifier	16K	16K	Yes		Data field for shipping note number assigned by supplier
Shipping Note Reference	3551354	3551354	Yes	Exception rule: 0 (zero) is allowed.	Suppliers shipping note reference number is 3551354
Data Element Separator	^G_S	@	Yes		New Data Field
Data Identifier	V	V	Yes		Data field for vendor number assigned by customer
Continental Vendor No.	310734	310734	Yes	First part of MAT-ID (RAW-ID)	Our supplier (vendor) number is 310734
Data Element Separator	^G_S	@	Yes		New Data Field
Data Identifier	3S	3S	Yes		Data field for unique package-id on smallest packaging unit
Unique Package-ID	S000001069425	S000001069425	Yes	Second part of MAT-ID (RAW-ID)	Singlelabel with unique id S000001069425 behind vendor number. 310734S000001069425 is the unique MAT-ID
Data Element Separator	^G_S	@	Yes		New Data Field
Data Identifier	Q	Q	Yes		Data field for the quantity (number of parts in the packaging unit)
Quantity	1200NAR000	1200NAR000	Yes	See specification page 16.	There are 1200 pieces (NAR = Number of articles) in this packaging unit
Data Element Separator	^G_S	@	Yes		New Data Field
Data Identifier	20T	20T	Yes		Data field for the number of batches inside this packaging unit
Batch-ID (Batch-Counter)	1	1	Yes	Possible content is 1 or 2	There is only one batch inside this packaging unit
Data Element Separator	^G_S	@	Yes		New Data Field
Data Identifier	1T	1T	Yes		Data field for the first batch number assigned by manufacturer
1. Batch Number	126A006 C	126A006 C	Yes		1. Batch number (LOT) of manufacturer for traceability is 126A006 C
Data Element Separator	^G_S	@	Yes		New Data Field
Data Identifier	2T	2T	Yes		Data field for the second batch number assigned by manufacturer
2. Batch Number			Depends	Is empty, if only one batch exist. (Batch-ID =1)	Field is empty. No second batch number exist
Data Element Separator	^G_S	@	Yes		New Data Field
Data Identifier	1Z	1Z	Yes		Data field for free supplier entries, assigned by supplier.
Supplier Data	CN-N1	CN-N1	Depends	Can be empty. Supplier can use this field or not.	Supplier has stored the ID CN-N1 for internal usage. Will be stored by us, but is not an information for us.
Format Trailer	^R_S	@	Yes		Format envelope ends. No new format envelope.
Message Trailer	$^E_{OT}$	@	Yes		End of transmission. Message ends.

VI.   Appendix A: Example of MAT-Labels

Proposals for field description:

- Part No.	= Customer Part Number
- Man. Part No	= Manufacturer Part Number
- Quantity	= Quantity
- Add.Info	= Additional Part Information
- Man.Date or Date of Man.	= Date of Manufacturing
- Exp. Date	= Expiration Date
- Suppl.	= Supplier Name
- 1. Batch	= Batch-No. #1
- 2. Batch	= Batch-No. #2
- MSL or MS-Level	= Moisture Sensitive Level
- Index	= Material Revision (Part-Index)
- Purchase	= Purchase Order Number
- ShippingNote	= Shipping Note Number (Shipping Reference)
- Part Name	= Part Description
- Ord.Code	= Ordering Code
- Man.Loc.	= Manufacturer Location

Standard label layout (all mandatory data fields printed). Size depends on package type and package size). Size definition, see chapter 6.1.

Part No.:	**00196508A0**
Quantity:	**1200**
Index:	MS-Level: 5a
Add.Info:	
Date Code: 20120323	Expiry Date: 20130323
Man. Loc.:	JPN-TOKYO
1. Batch:	126A006C
2. Batch:	
Part Name:	Pressure Sensor
Shipping Note: 3551354	Purchase: 6100004089
Supplier-ID: 310734	Package-ID: S000001069425
Ord. Code: E0151CIT00003	
Man. Part-No.: E0151CIT00003	
Supplier-Data: CN-N1	**RoHS**
Supplier: Sample & Co.	

Example # 1

Small Label (with less data fields printed)

Part No.: **00196508A0**
Quantity: **1200**   Index:
1. Batch: 126A006C
2. Batch:
Supplier-ID: 310734
Package-ID: S000001069426
Expiry Date: 20130323   **RoHS**

Example # 2

VII.   Appendix B: Related Documents

ANSI MH10.8.2	Data Identifier and Application Identifier Standard
2011/65/EU	Restriction of the use of certain hazardous substances in electrical and electronic equipment; EU-RoHS; (non automotive related)
IPC/JEDEC J-STD-020	Moisture/Reflow Sensitivity Classification for Non-hermetic Solid State Surface Mount Devices
ISO 780	Packaging – Pictorial Marking for Handling of goods
ISO 3166-1	Codes for the representation of names of countries and their subdivisions - Part 1: Country codes (Alpha 3 Character Country-Code)
ISO/IEC 15417	Information technology - Automatic identification and data capture techniques - Code 128 bar code symbology specification
ISO/IEC 15434	Information technology -- Automatic identification and data capture techniques -- Syntax for high-capacity ADC media
ISO/IEC 16022	Information technology -- Automatic identification and data capture techniques -- Data Matrix bar code symbology specification
UN/ECE Rec. 20	Recommendation No.20 of WP.4: Codes for units of measure used in international trade
VDA 4902	Warenanhänger (barcode-fähig)
VDA 4922	Speditions-Auftrag

VIII.   Appendix C: MAT-Label Team

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