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Bosch-AE Instruction MAT-Label

based on

Requirements on Marking of Goods and Accompanying Information for Purchased Production Parts (MAT-Label)

This instruction is based on the specification “Requirements on Marking of Goods and Accompanying Information for Purchased Production Parts (MAT-Label), established in collaboration with Becom, Bosch, CMS, Continental, Hella, Siemens, and Zollner.

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1 Prologue

1.1 Purpose

This instruction describes Bosch-AE-specific requirements for the MAT-Label and complements the specification “*MAT-Label Requirements on Marking of Goods and Accompanying Information*” for Purchased Production Parts.

Version description

Version	Alteration Number	Alteration	Date
0.0	-	First edition	19.09.2008
1.0	-	Implementation of DMC sample and string	08.10.2008
11	-	Correction of Version Number for SAP	24.10.2008
12	1 039 A05 871	Link to the MAT-Label Spec, Peel-off Label	14.11.2008
13	1 039 A50 020	Chapter 5-9 supplements (material blocks)	17.07.2009
14	1 039 A52 969	Implementation of Master-Single Concept and Adaption's	21.09.2011
15	1 039 A64 548 not released	<ul style="list-style-type: none"> - New Version of “Requirements on Marking of Goods and Accompanying Information for Purchased Production Parts 2.6” - Change of contact-address - Barcodes removed - Modified requirement on PCBs 	20.12.2016
16	1 039 A64 548	<ul style="list-style-type: none"> - Contact address for E-Mails corrected - Requirements for Revision-Level stated more precisely 	03.07.2017

Acceptance

Department	Department	Department
AE/PJ-TIP	AE/LOI Ehnert	AE/MFT6
Date	Date	Date
Signature	Signature	Signature
Signed	Signed	Signed

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1.3 Basic information

1.3.1 List of Terms

CM	Car Multimedia (Bosch-Division)
CN	Competence Network as an group of specialists in the CoC
CoC	Center of Competence as a central department of specialists
DMC	Data matrix-Code
SPU	Smallest packaging unit

1.3.2 General

The Bosch-AE instruction complements the general MAT-Label Specification "MAT-Label Requirements on Marking of Goods", actual version.

The MAT-Label contains all data, which are of fundamental importance for traceability in the automotive industry and logistic supply chain.

The MAT-Label has to be applied onto the smallest package unit of material, including electronic and mechanic components as well as printed circuit boards and consumables. The traceability for material at Bosch is based on the MAT-ID. The MAT-ID consists of the fixed Vendor Code (Supplier- ID) and a unique Package-ID.

Only one MAT-Label per smallest package unit is allowed.*) The Package-ID on each MAT-Label must be unique over all delivering plants of a supplier and must not be repeated. The responsibility of the uniqueness lies with the supplier.

The implementation of the MAT-Label becomes mandatory immediately after the release of the sample label of the supplier.

The label has to be **provided** immediately for all below listed receiving plants as soon as it has been released and without further demand of the receiving plants.

If for some material attachment is not clear or label does not fit to packaging-type this must be clarified with AE/MFT2.2 before release.

Any change of MAT-label must be notified by AE/MFT2.2

*) the definition of SPU is given by the requesting RB-Plants



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1.3.3 AE- and associated plants

The below listed plants belong to AE or are joint ventures.

Beside that the division CM follows the implementation of the MAT-Label for electronic material.

AE locations	Germany	AnP RtP SzP	(Germany – Ansbach) (Germany – Reutlingen) (Germany – Salzgitter)
	Europe	CljP MoP RBEM RBHH	(Romania – Cluj) (France – Mondeville) (Spain – Madrid) (Hungary – Hatvan)
	NAFTA	AdP JuP RBLA	(USA – Anderson) (Mexico – Juarez) (Brasil – Campinas)
	Asia/Pacific	RBAC RBAI RBAU RBKR RBSA	(China – Suzhou/Wujin) (India – Naganathapura) (Australia – Clayton) (Korea – Daejeon) (South Africa – Brits)
	Joint Ventures	UAES MICO	
CM Locations		Hildesheim Braga Penang	

Coordinator for Material-Labels (e.g. MAT-Label) is the *CN Marking and Identification* of Bosch-AE (AE/MFT2.2 Ansbach/Germany).

The releasing location for all suppliers is AE/TEF8.2-CN and it is located in Suzhou/China. A pdf- or jpg-file in appropriate resolution must be sent by e-mail beforehand.

Contact: Release.MAT-Label@cn.bosch.com

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1.3.4 Return Shipments

Return shipments have to be relabeled with a new unique Package-ID at the supplier, before sending the shipment back to Bosch again. Identical Package-IDs will be rejected.

1.3.5 Mounting of MAT-Labels

The Label must be well readable and may not cover other markings.
The location of label and size must follow the specification of packaging.
Depending on the packaging, following types of attaching a label are defined.

(If any topic is not clearly understood, Release.MAT-Label@cn.bosch.com has to be contacted)

- **Smallest Packaging Unit :**

The regular Mat-Label must be attached directly to the smallest packaging unit.

Exceptions:

- **Double packed material:**

For specific protection packs like ESD- and Poly- Packs or film containers (e.g. on Dry-Packs of moisture sensitive devices) the MAT-Labels must be outside on the bag. The material can be delivered in following way:

Preferred: A Peel-off (sandwich-) Label on this Package has to be used. The peel-off label must be removable without destruction. This Label has to be permanently adhesive, so it can be attached to the inner packaging in AE/production at time of opening.

Alternative: A label has to be permanently attached at the reel inside and outside the Pack by applying an identical MAT-Label. (This process must be agreed by AE/MFT2.2.)

- **Quality-Aspects:**

If the smallest packaging units cannot be accessed in the logistics at Bosch/AE without interfering with cooling-chain or quality-restrictions (e.g. dust-particles, bended pins, ...) Master-Single principle must be used to identify the outer packaging unit

- **Card-board-packaging:**

At Bosch/AE no card-board-boxes are allowed in production area.

If material is sent in cardboard box, the label must be attached to the box in a way that it can be removed at Bosch-Logistics easily and without damaging (e.g. transparent envelope.). Then the logistics will attach it to an internal transport container after repacking the material.

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- **Size-Limitations:**
If a label for a packaging is too small to carry the complete set of data and/or the DMC with full data, AE-MAT-Label release must be contacted to support on a solution. (The solution must be agreed by AE/MFT22)

- **Returnable Container:**
For returnable containers currently a VDA4902-label is requested.
 - If the container is both a logistic sub-unit and smallest packaging unit for production, a MAT-Label must be attached to the container.
 - If the container is a complete shipping unit (Quad-box, palette, ..), the label must contain both information, VDA-Label plus MAT-Label (e.g. as a split label with top-part VDA-Label and lower part MAT-Label)

- **Outer Packaging Unit:**
When a MAT-Label is required for outer packaging units that contain multiple smallest packaging units, the master-single-principle must be used. Mostly the Master-label is required for outer packaging because at goods receiving the outer container cannot be unpacked.

1.3.6 Collective Part-Numbers

At BOSCH-AE it is possible that several suppliers provide identical material. In this case, Bosch provides two Part Numbers to a supplier a customer-specific one and a collective part-number.

If such a material is ordered with the collecting-part number, the single-part-number must be additionally listed in the field "Additional Part Information" of DMC and also be printed as text.

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2 Material related information

The following part of the document describes the variants of the label, necessary for different groups of material:


- Electronic Components
- Printed Circuit Boards
- Consumables
- Mechanical Parts

2.1 Label

The Content of the Labels is defined and is valid for all kind of material. The size of Label is depending on package and open to suppliers as long it is suitable to content. The layout only differs for PCB where an extra symbol is required to indicate panels with bad boards on.

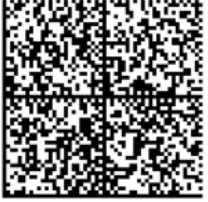
2.1.1 MAT-Label Layout

Label sample for Electronics, Mechanics and Consumables:

	(2) Part No: 9800121640	(19) Quantity: 500
	(4) Ord. Code: SL105103MAA-S REEL	(8) Index: 01
	(10) Man. Date: 20161128	(21) 1. Batch: 10820KEAAR
	(11) Exp. Date: 20180527	(22) 2. Batch:
	(9) Add. Info:	(13) MS-Level: 5
(17) Supplier-ID: 815	(18) Package-ID: S000123456789	
(5) Part Name: 10KOhm 5%		
(16) Supplier: Sample_CO	(14) Purchase: 55062387/001	(12) RoHS
(7) Man. Loc.: CHN-SHENZHEN	(15) Shipping Note: 412938/001	
(3) Man. Part No.: SL105103MAA-S	(23) Supplier Data: CUSTOMER01	

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Label sample for PCBs:

	② Part No: 9800121640	⑱ Quantity: 500
	④ Ord. Code: SL105103MAA-S REEL	⑧ Index: 01
⑩ Man. Date: 20161128	⑳ 1. Batch: 10820KEAAR	
⑪ Exp. Date: 20180527	㉑ 2. Batch:	
⑨ Add. Info:	⑬ MS-Level: 5	
⑰ Supplier-ID: 815	⑱ Package-ID: S000123456789	
⑤ Part Name: 10KOhm 5%	⑫ RoHS	
⑯ Supplier: Sample_CO	⑭ Purchase: 55062387/001	⑳ X1
⑦ Man. Loc.: CHN-SHENZHEN	⑮ Shipping Note: 412938/001	
③ Man. Part No.: SL105103MAA-S	㉓ Supplier Data: CUSTOMER01	

- * ㉔ : This label shows the extra “X” to indicate that a brick contains PCBs with one bad single board,
if there are no bad-boards on the panel, “X plus quantity” may not be printed as text

2.1.2 Definition of the MAT-Label content

Legend:

The red current numbers (2-25) are listed in the scheme below.

No.	Data Field	Proposals for field description	Definition / Description	Data Identifier	Length	Format N = Numerical, A/N = Alphanumerical, D = day, M = month, Y = year	Example	Data Matrix	Printed Text
Label Information									
1.	Label Version		The revision level (version) 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	Part No.	Part number of Bosch (10 digits without separators)	P	10	A/N	9800121640	yes	yes (highlighted)
3.	Manufacturer Part Number	Man. Part No.	Internal manufacturer part number.	1P	Max. 35	A/N	SL105C103MAA-S	yes	yes
4.	Ordering Code	Ord. Code	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	SL105103MAA-S_REEL	yes	yes
5.	Part Description (Part Name)	Part Name	Specified description of the ordered part (or part name).	-	Max. 30	A/N	10KOhm 5%	no	yes
6.	Manufacturer Number		Explicit identification for the manufacturer, DUNS-Nr.	12V	Max. 13	A/N	315699660	yes	no



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No.	Data Field	Proposals for field description	Definition / Description	Data Identifier	Length	Format N = Numerical, A/N = Alphanumerical, D = day, M = month, Y = year	Example	Data Matrix	Printed Text
7.	Manufacturer Location	Man. Loc.	Naming the manufacturing location/locations	10V	Max. 20	A/N	CHN-SHENZHEN2	yes	yes
8.	Revision Level/ Index	Index	Revision status of the part. The actual Bosch- Revision-Index must be filled in. If not existing the change number must be given here.	2P	Max. 14	A/N	AA	yes	yes
9.	Additional Part Information	Add. Info	Used differently and flexible filled E.g. brightness of the LEDs.	20P	Max. 30	A/N	2A-T1	yes	yes
More Part Information									
10.	Date of Manufacturing	Man. Date	Date of manufacturing is related to the last manufacturing process	6D	8	YYYYMMDD	20161128	yes	yes
11.	Expiration Date	Exp. Date	The Expiration Date of the part (defined by the manufacturer (depending on production date)).	14D	8	YYYYMMDD	20180527	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
13.	MS-Level	MSL or MS-Level	Moisture Sensitivity Level according to IPC/JEDEC J-STD-020.	Z	Max. 6	A/N, "N" if not applicable (text)	5	yes	yes
Logistic and Traceability Information									
14.	Purchase Order Number	Purchase	Order number assigned by customer to identify a purchasing transaction.	K	Max. 18	A/N	55062387/001	yes	yes
15.	Shipping Note Number	Shipping Note	Shipping Note Number of the shipping note and MAT-Label must be the same.	16K	Max. 12	A/N	412938/001	yes	yes
16.	Supplier Name (no real data field!)	Suppl.	The Supplier Name.	-	Max. 30		SAMPLE_CO.	no	yes
17.	Supplier-ID (Vendor Number)		The fixed Supplier-ID (of the customer) for the supplier defined by AE/MFT2.2	V	Max. 10	A/N	815	yes	yes
18.	Package-ID		The explicit, unique number per single package. It has to be unique per supplier (Supplier-ID) 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	S000123456789 (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, see example	500NAR000 (in DMC) (printed: 500)	yes	yes (highlighted)
20.	Batch-Counter		Batch-Counter identifies the number of batches (1 or max. 2 batches per smallest package unit e.g. reel).	20T	1	N	2	yes	no
21.	Batch-No. #1	1. Batch No.	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 batch number should be changed too.	1T	Max. 17	A/N	10820KEAAR	yes	yes
22.	Batch-No. #2	2. Batch No.	Batch number for the second batch - if applicable.	2T	Max. 17	A/N	24001LFHHS	yes	yes
Other									

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23.	Supplier Data	Supplier own information that may be used by the supplier.	1Z	Max. 30	A/N	CUSTOMER01	yes	optional
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2.1.3 Data Matrix Code (DMC)

String sample:

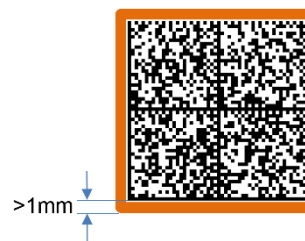
```

D>@06@12S0002@P9800121640@1P SL105103MAA-S@31PSL105103MAA-S_REEL
@12V315699660@10VCHN-SHENZHEN2@2PAA@20P@6D20090218
@14D20110218@30PY@Z5@K55062387/001@16K412938/001@V815
@3SS000123456789@Q500NAR000@20T2@1T10820KEAAR@2T24001LFHHS
@1ZCUSTOMER01@@
  
```

@ = separator nX = identifier D>@06 = prefix @@ = suffix

Requirements:

- No " " (blanks) allowed in the DMC-string (a space has to be replaced by "_")
- All the specified parameters have to be according to their specified format in the DMC string
- Only upper-case letters allowed
- Defined set of permitted printable symbols:
 - * Numbers: 0 - 9
 - * Characters: A-Z (upper case)
 - * Special Characters: " _ ", " - ", " . ", " / ", " ", " # ", " + ", " * ", " % ", " . "
- Identification of a MAT-Label:
 - Prefix: "D>@06@12S0002@" must be used.
 - Suffix: The data string of the DMC must end with "@@"
- Separator between data-fields is @
- The data given in the fields of DMC have to be identical with the corresponding printed text on the label
- Order of Data-fields:
 - The order must follow the sequence given in the table of chapter 2.1.2
- The Module width of the DMC has to be 0,34 mm (4 Dot/Mod)
Deviations must be agreed by AE/MFT2.2
- The classification of the code quality has to be min. grade B related to ISO 15415
- Quiet Zone: min. 1mm around the code:
A deviations must be agreed by AE/MFT2.2



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2.1.4 Location (scheme Pos 7.)

The Manufacturer Location has to be structured by using a maximum of 20 digits following the definition below:

+ Country code acc. to ISO 3166-1 ALPHA-3	[3 digits]	} [max. 20 digits]
+ "-"	[1 digit]	
+ plant location	[required digits]	
+ plant counter, required if more than one plant exists at that location	[0-1 digit]	

Sample: CHN-SHENZHEN2

2.1.5 Revision Level

BOSCH defines for each material /component, a “change number of material BOM”.

If Bosch provides a “Revision Index ” additionally, this Index has to be displayed on the label (instead of the Change Number)

Each data, Revision Index or Change Number, must be printed both as text and as part of the DMC.

2.1.6 RoHS (scheme Pos 12.)

- RoHS according to actual specification
please print RoHS as



2.1.7 Moisture Sensitivity Level (Scheme Pos. 13.)

If this part is moisture-sensitive, then the MS-Level (Moisture Sensitivity Level) has to be entered according to the industrial standard IPC/JEDEC J-STD-020.

If level 6 for time on label is required, the time has to be added to the level in hours

format: 6-hhhh

Example: 6-0120 (for an individual time of 5 days)

If the part is not moisture-sensitive, then the letter “N” has to be printed (for not moisture-sensitive).

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2.1.8 Supplier Name (Scheme Pos. 16.)

It can be supplied as text or Logo (not part of the DMC).

2.1.9 Supplier-ID (Scheme Pos. 17.)

The fixed Supplier-ID for the MAT-Label is defined by Bosch-AE (AE/MFT 22) and will be provided for each Supplier.

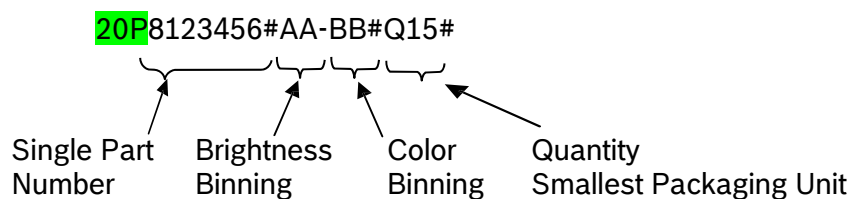
2.2 Details for Electronic components

2.2.1 Additional Part Information (Scheme Pos. 9)

The data field “Additional Part Information” is intended to be used flexibly. For different cases the following information are required.

- The Additional Part Information is used for the Single Part Number, if required. Then the Collective Part Number has to be entered in Customer Part Number.
→ 8905123456
- A binning-information is required for LEDs. Then LED (Light-Emitting Diode) classification must be filled by using a code as minimum requirement for the Brightness- and Color Binning. The Hash-character “#” serves as delimiter within the field between each dataset.
→ #AA-BB#
- If Master/Single-Principle is required for the smallest packaging, the quantity of the smallest packaging unit must be given.
(Please refer to chapter MASTER/SINGLE Concept)
→ #Q15#

Example:



LED (Light-Emitting Diode)

For the classification of the LED, only the manufacturers binning shall be used. Use the minus sign “-“as separator. No space is allowed.

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A range of binnings in one smallest packaging units is not allowed. The classes of the LED's which are contained in the smallest package unit must be described exactly by the given binning information.

If the LED contains several chips, the binning-information on the individual chips must be concatenated with a "+" character. The order of the binning-Information symbol has to correspond with the order of the data sheet.

Example for a 2-chip LED: "AA-BB+CC-DD"

The binning code may have more or less characters for a binning than the indicated two characters in the above listed example. Do not exceed the defined maximum number of characters for the data field "Additional Part Information".

For LED's, the content of "Additional Part Information" must be printed as plain text on the MAT-Label, too.

2.2.2 Quantity (Scheme Pos. 25.)

If the smallest package unit contains a quantity exceeding 5 digits (200.000 pcs) then

- This quantity has to be entered in field 19. of the DMC and printed as text on the label (e.g. "200 000")
- the unit for piece is "NAR" (number of articles)

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2.3 Mechanical Components

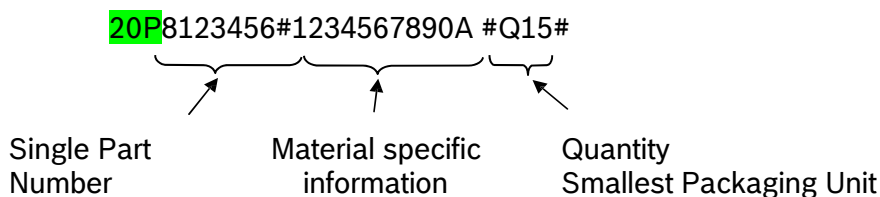
Basically, it is same content as for Electronics. Only the use of the field “Additional Information” may be different.

2.3.1 Additional Part Information (Scheme Pos. 9)

The data field “Additional Part Information” is intended to be used flexibly. For different cases the following information are required.

- The Additional Part Information is used for the Single Part Number, if required. Then the Collective Part Number has to be entered in Customer Part Number.
→ 8905123456
- Additional Information to Material:
If an additional parameter for the material is required, it has to be listed here. The Hash-character “#” serves as delimiter within the field between each dataset.
→ #1234567890A#
- If Master/Single-Principle is required for the smallest packaging, the quantity of the smallest packaging unit must be given.
(Please refer to chapter MASTER/SINGLE Concept)
→ #Q15#

Example:



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2.4 Printed Circuit Boards

The PCB-label has some special requirements that are not requested from e.g. a label for mechanics.

For PCBs it must be indicated whether the brick contains bad-boards or not.

If special data must be provided for BOSCH, e.g. batch of inlays, this will be part of a special agreement between supplier and requesting plant. This data has to be provided as “Supplier-Data”.

2.4.1 Additional Part Information

The data field “Additional Part Information” is intended to be used flexibly. For different cases the following information are required.

- **Additional Information to Material:**
If an additional parameter for the material is required, it has to be listed here. The Hash-character “#” serves as delimiter within the field between each dataset.
Here the Solder Resist Lacquer/Solder Mask has to be entered.
- **Bad boards:**
If the brick consists of panels with bad-boards on (defective boards from the PCB-supplier) the number of X-Out boards on a panel has to be given here
If no bad-boards are on the panel


Format: #QXnn# with n - nn = number of bad boards per panel
e.g. #QX1# means one bad single board on each panel in this brick

If only good boards are on the panel, the value #QX0# is allowed in Additional Part Information

- If Master/Single-Principle is required for the smallest packaging, the quantity of the smallest packaging unit must be given.
(please refer to chapter MASTER/SINGLE Concept)
→ #Q15#

Example:

20P8123456472#MPROBIMER77#QX1#



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Single Part
Number

Material specific
information

Quantity of bad boards
per panel (must be
skipped if no badboards)

2.4.2 Quantity

The quantity represents the number of good single PCBs in a brick. It does not contain the amount of panels. If there are bad-boards allowed on the panels, the quantity only gives the number of good single-boards
Quantity-Unit is NAR

2.4.3 X-Out:

If bricks contain bad-boards, this must be marked clearly with a big "X" followed by the quantity of bad-boards per panel

see sample label 24

If the panel only consists of good boards, no Xout indicator may be printed as text.

In addition, the number of bad single boards per panel must be listed in "Additional Part Information"

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2.5 Consumables

Consumables are for example glue, soldering paste, silver conductive adhesive etc. For every smallest package unit with a diameter smaller than 50 mm (e.g. cartridges or syringes), the Master-Single principle will be applied. The Single-Label has to be attached on the smallest unit and the Master-Label on the outer package.

All previous label data which are in use for Bosch AE remain unchanged. The Single-Label DMC will be complemented on the previous labels and will be optically separated by a frame. If no other label exists, a Single-Label must be applied.

For information to the Master-Single concept, please refer to chapter III.

2.5.1 Customer Part Number (Scheme Pos. 2.)

Regulation to Container Part Number and Material Part Number

At Bosch two types of part number are used to identify consumables

- **Material Part Number** (German: Stoff Sachnummer) e.g. 5998...
It describes the specified characteristics of a material, but no quantity
- **Container Part Number** (German: Gebinde Sachnummer) e.g. 5000...
It describes the quantity and type of packaging for a specific material
with this part number, the material inside the container is also defined.

Use of the two types of part numbers:

Generally the part number of the order has to be used for the customer part number.

If the part number of the order is the container part number, the material part number has to be listed in the field "additional part information"

If the part number of the order is the material part number and a container part number is defined for this type of packaging, the container-part number has to be listed in the field "additional part information". If no container-part number has been defined the field "additional part information" may be empty.

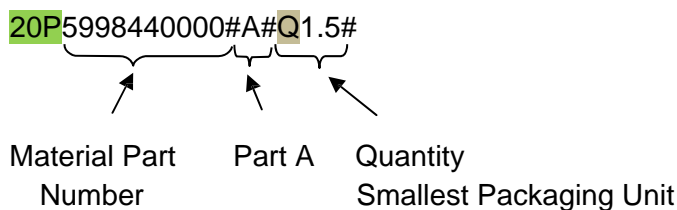
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2.5.2 Additional Part Information (Scheme Pos. 9)

The data field "Additional Part Information" is intended to be used flexibly. For different cases the following information are required.

- The Additional Part Information is provided for the Material Part Number (Stoff Sachnummer). → 5998440000
- The Additional Part Information is provided for material specific information, e.g. component adhesives (Part A or Part B). Hush "#" as identifier → #A
- In case of Master/Single- Principle, the quantity of the smallest packaging unit is necessary. Please refer to chapter III. → #Q1.5#

Example:



2.5.3 Moisture Sensitivity Level (Scheme Pos. 13.)

If this part is moisture-sensitive, then the MS-Level (Moisture Sensitivity Level) has to be entered according to the industrial standard IPC/JEDEC J-STD-020.

If level 6 for time on label is required, the time has to be added to the level in hours

format: 6-hhhh

Example: 6-0120 (for an individual time of 5 days)

If the part is not moisture-sensitive, then the letter "N" has to be printed (for not moisture-sensitive).

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3 Master/Single Concept

3.1 General

Basically the Master/Single Concept is needed, when the label on the smallest package unit is not accessible at goods incoming. Therefore the Single-Label has to be attached on the smallest unit and the Master-Label on the outer package.

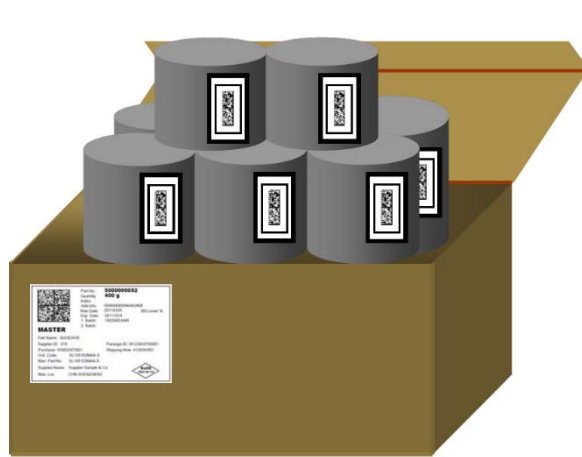
The link between the Master and the Single-Label is the Package-ID.

For every smallest package unit with a diameter smaller than 50 mm (e.g. cartridges or syringes) or any special packaging forms (e.g. Blister), the Master-Single principle must be applied.

All previous labels which are in use at Bosch AE must remain. The content of the Single-Label will be complemented and optically separated by a frame or a separate Single Label will be added

The Master/Single Concept may only be used in agreement with AE/MFT2.2.

Packaging sample:



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3.1.1 Concept of Master- and Single-Label

To realize this concept a link between Master-Label on the outer-box and Single-Label on the smallest package unit has to be implemented. This is done by using the same data of the first 10 significant digits of the Package-ID in both labels (Master and Single-Label). An example is shown in figure 1.

An intersection between the Package-ID from the Master/Single Concept and the Package-ID from the standard MAT-Label is not permitted. The warranty of the uniqueness is with the supplier.

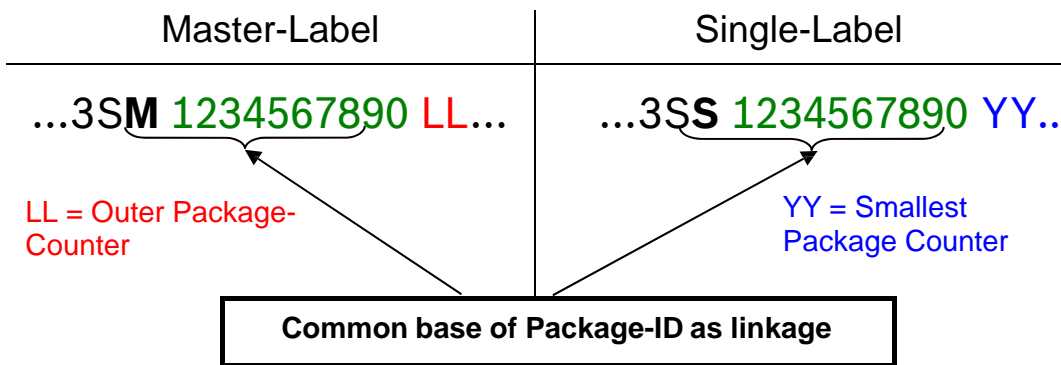


Table 1: List of possible combinations of the Counter

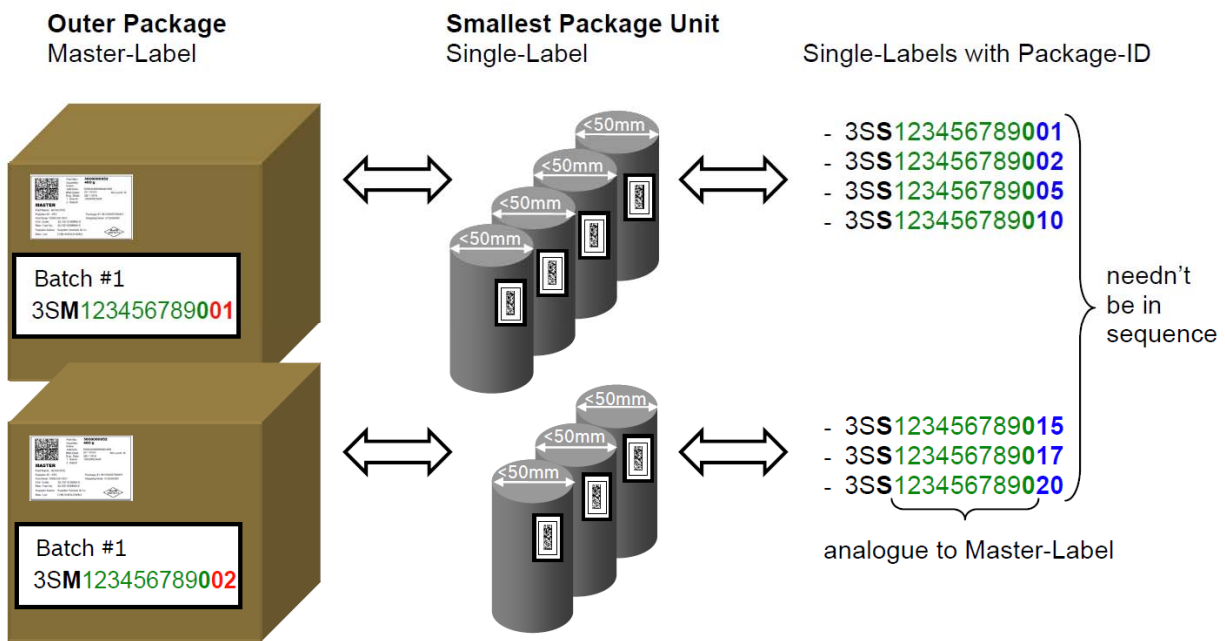
Char	Range	Combinations
0 – 9	01 – 99	99
0 – 9 / A – Z	01 – ZZ	1295
0 – 9 / A – Z / (“#” – “_”) ¹	01 – __	2115

(¹ Special Chars in this order are: “#”, “%”, “*”, “+”, “,”, “-”, “.”, “/”, “:”, “_”)

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3.1.2 Procedure with Single Batch

The following figure shows the procedure of the Master-Single principle with a single batch.



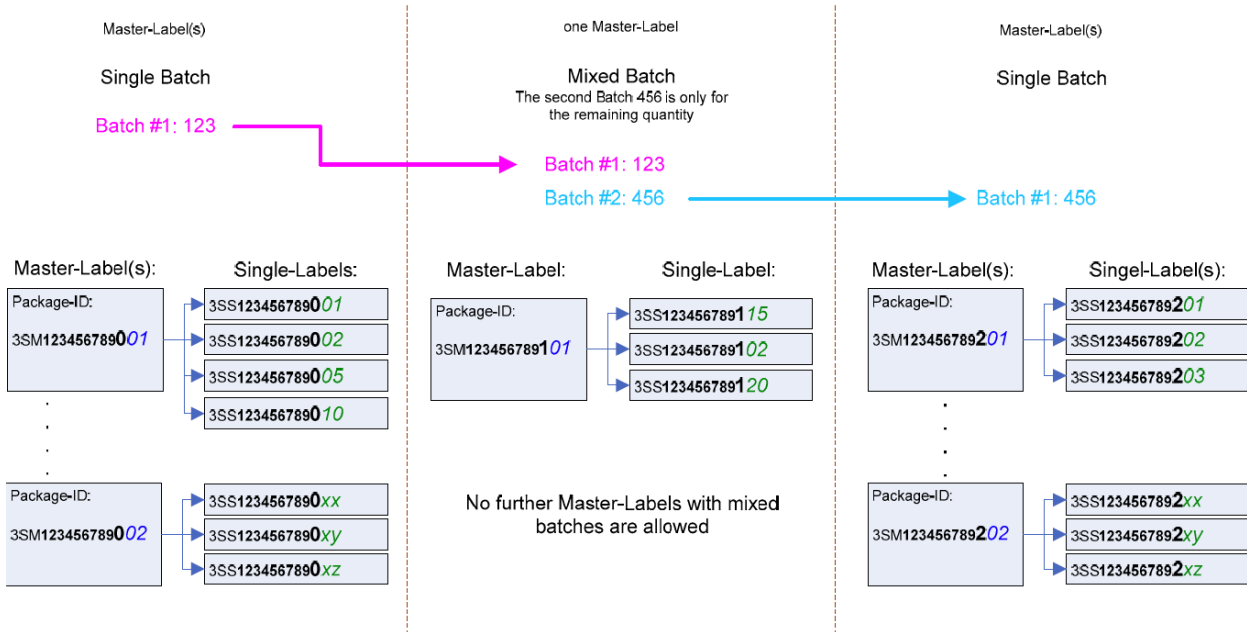
3.1.3 Procedure with Mixed Batches

The following figure shows the procedure of the Master-Single principle with mixed batches.
E.g. remaining quantity

With every change in Batch-information a new Master-Id number with corresponding Single-ID number has to be created.


It should be avoided to have Master-Labels with mixed batches. If it cannot be avoided, the procedure of marking is displayed in the following schematic.

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3.1.4 The Master-Label

Label sample:

	② Part No: 9800121640	⑱ Quantity: 500
	④ Ord. Code: SL105103MAA-S REEL	⑧ Index: 01
	⑩ Man. Date: 20161128	⑳ 1. Batch: 10820KEAAR
	⑪ Exp. Date: 20180527	㉑ 2. Batch:
	⑨ Add. Info:	⑬ MS-Level: 5
⑰ Supplier-ID: 815	⑱ Package-ID: S000123456789	
⑤ Part Name: 10KOhm 5%		
⑰ Supplier: Sample_CO	⑭ Purchase: 55062387/001	⑫ RoHS
⑦ Man. Loc.: CHN-SHENZHEN	⑮ Shipping Note: 412938/001	
③ Man. Part No.: SL105103MAA-S	㉓ Supplier Data: CUSTOMER01	

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Legend:

The red current numbers (2-23) as listed in the scheme below.

No.	Data Field	Proposals for field description	Definition / Description	Data Identifier	Length	Format N = Numerical, A/N = Alphanumerical, D = day, M = month, Y = year	Example	Data Matrix	Printed Text
1.	Label Version		The revision level (version) is a fixed entry and serves the recognition of the label or its version.	12S	4	N "0002"	0002 (fixed data)	yes	no
2.	Customer Part Number	Part No.	Part number of Bosch (10 digits without separators)	P	10	A/N	9800121640	yes	yes (highlighted)
3.	Manufacturer Part Number	Man. Part No.	Internal manufacturer part number.	1P	Max. 35	A/N	SL105C103MAA-S	yes	yes
4.	Ordering Code	Ord. Code	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	SL105103MAA-S_REEL	yes	yes
5.	Part Description (Part Name)	Part Name	Specified description of the ordered part (or part name).	-	Max. 30	A/N	Adhesive	no	yes
6.	Manufacturer Number		Explicit identification for the manufacturer, DUNS-Nr.	12V	Max. 13	A/N	315699660	yes	no
7.	Manufacturer Location	Man. Loc.	Naming the manufacturing location/locations	10V	Max. 20	A/N	CHN-SHENZHEN2	yes	yes
8.	Revision Level/ Index	Index	Revision status of the part.	2P	Max. 14	A/N	AA	yes	yes
9.	Additional Part Information	Add. Info	Used differently and flexible filled e.g. brightness of the LEDs.	20P	Max. 30	A/N	2A1#B#Q1.0#	yes	yes
10.	Date of Manufacturing	Man. Date	Date of manufacturing is related to the last manufacturing process	6D	8	YYYYMMDD	20090218	yes	yes
11.	Expiration Date	Exp. Date	The Expiration Date of the part (defined by the manufacturer (depending on production date)).	14D	8	YYYYMMDD	20110218	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
13.	MS-Level	MSL or MS-Level	Moisture Sensitivity Level according to IPC/JEDEC J-STD-020.	Z	Max. 2	A/N, "N" if not applicable (text)	5	yes	yes
14.	Purchase Order Number	Purchase	Order number assigned by customer to identify a purchasing transaction.	K	Max. 18	A/N	55062387/001	yes	yes
15.	Shipping Note Number	Shipping Note	Shipping Note Number of the shipping note and MAT-Label must be the same.	16K	Max. 12	A/N	412938/001	yes	yes
16.	Supplier Name (no real data field!)	Suppl.	The Supplier Name.	-	Max. 30		SAMPLE_CO.	no	yes

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No.	Data Field	Proposals for field description	Definition / Description	Data Identifier	Length	Format N = Numerical, A/N = Alphanumerical, D = day, M = month, Y = year	Example	Data Matrix	Printed Text
17.	Supplier-ID (Vendor Number)		The fixed Supplier-ID (of the customer) for the supplier defined by AE/MFT2.2	V	Max. 10	A/N	815	yes	yes
18.	Package-ID		The explicit, unique number per single package. It has to be unique per supplier (Supplier-ID) 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	M000123456789 (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, see example	50KGM000 (in DMC) (printed: 500)	yes	yes (highlighted)
20.	Batch-Counter		Batch-Counter identifies the number of batches (1 or max. 2 batches per smallest package unit e.g. reel).	20T	1	N	2	yes	no
21.	Batch-No. #1	1. Batch No.	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 batch number should be changed too.	1T	Max. 17	A/N	10820KEAAR	yes	yes
22.	Batch-No. #2	2. Batch No.	Batch number for the second batch - if applicable.	2T	Max. 17	A/N	24001LFHHS	yes	yes
23.	Supplier Data		Supplier own information that may be used by the supplier.	1Z	Max. 30	A/N	CUSTOMER01	yes	optional

3.1.5 Manufacturer Location (Scheme Pos. 7.)

The Manufacturer Location has to be structured by using a maximum of 20 digits to the definition of Alphanumeric to Bosch-AE in the following way

- | | | |
|---|-------------------|-------------------|
| + Country code acc. to ISO 3166-1 ALPHA-3 | [3 digits] | } [max. 20 digits |
| + "-" | [1 digit] | |
| + plant location | [required digits] | |
| + plant counter, if more than one exist at the plant location | [0-1 digit] | |

Sample: CHN-SHENZHEN2

3.1.6 Additional Part Information (Scheme Pos. 9)

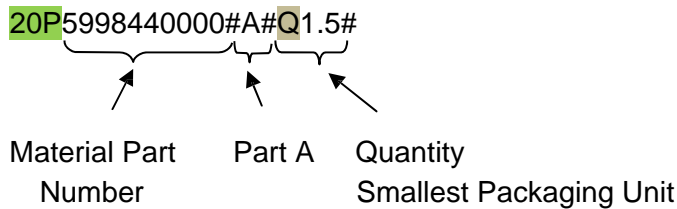
The data field "Additional Part Information" is intended to be used flexibly.

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For different cases the following information are required.

- The Additional Part Information is provided for the Material Part Number (Stoff Sachnummer). → 5998440000
- The Additional Part Information is provided for material specific information, e.g. component adhesives (Part A or Part B). Hush “#” as identifier → #A
- In case of Master/Single- Principle, the quantity of the smallest packaging unit is necessary, please refer to chapter III. → #Q1.5#

Example:



3.1.7 Moisture Sensitivity Level (Scheme Pos. 13.)

If this part is moisture-sensitive, then the MS-Level (Moisture Sensitivity Level) has to be entered according to the industrial standard IPC/JEDEC J-STD-020.

If the part is not moisture-sensitive, then the letter “N” has to be printed (for not moisture-sensitive)

3.1.8 Supplier Name (Scheme Pos. 16.)

It can be supplied as text or Logo (not part of the DMC).

3.1.9 Supplier-ID (Scheme Pos. 17)

The fixed Supplier-ID for the MAT-Label is defined by Bosch-AE (AE/MFI-CH) and will be provided for each Supplier.

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3.1.10 Data Matrix Code (DMC)

String sample:

String sample:

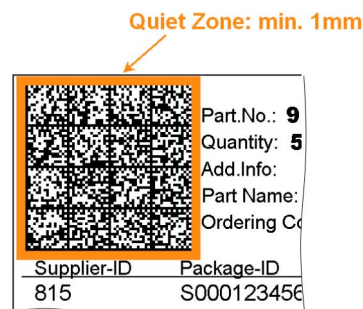
```

I>@06@12S0002@P9800121640@1P5L105103MAA-S@31P5L105103MAA-S_REEL
@12V315699660@10VCHN-SHENZHEN2@2FAA@20P#59984400000#A#Q1.0#@6D20090218
@14D20110218@30PY@Z5@K55062387/001@16K412938/001@V815
@3SM000123456789@Q50KGM000@20T2@1T10820KEAAR@2T24001LFHHS
@1ZCUSTOMER01@@
    
```

@ = separator nX = identifier I>@06 = prefix @@ =suffix

Requirements:

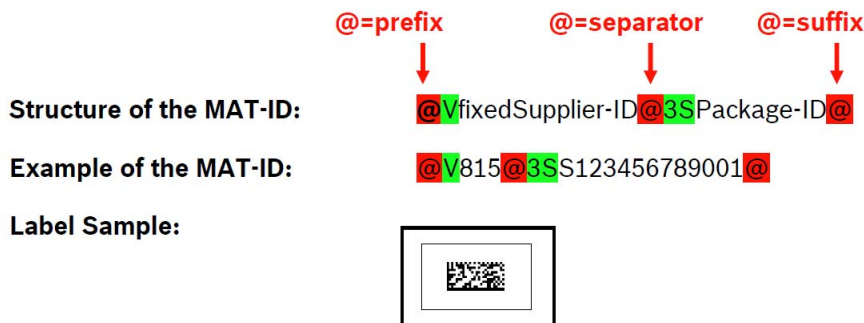
- No " " (blanks) allowed in the DMC-string (a space has to be replaced by "_")
- All the specified parameters have to be according to their specified format in the DMC string
- Only upper-case letters allowed
- Defined set of permitted printable symbols:
 - * Numbers: 0 - 9
 - * Characters: A-Z (upper case)
 - * Special Characters: "_", "-", ".", "/", " ", "#", "+", "*", "%", "."
- Identification of a MAT-Label:
 - Prefix: "I>@06@12S0002@" must be used.
 - Suffix: The data string of the DMC must end with @@
- Separator between data-fields is @
- The data given in the fields of DMC and 1D-code have to be identical with the corresponding printed text on the label
- Order of Data-fields:
 - The order must follow the sequence given in the table of chapter 3.1.4
- The Module width of the DMC has to be 0,34 mm (4 Dot/Mod)
 - Deviations must be agreed by AE/MFT2.2
- The classification of the code quality has to be min. grade B related to ISO 15415
- Quiet Zone: min. 1mm around the code:
 - A deviations must be agreed by AE/MFT2.2



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3.1.11 The Single Label

The rectangle Single-Label DMC consists of the MAT-ID, which contains the fixed Supplier-ID and the unique Package-ID for every smallest package unit.



Requirements:

- No " " (**blanks**) allowed in the DMC-string
- All the specified **parameters** have to be according to their specified format in the DMC string
- Only **upper-case** letters allowed
- Defined set of permitted characters (0-9, A-Z (upper case) "_", "-", ".", "/", ":", ";", "#", "+", "*", "%", ".")
- The data in the DMC and 1D-code have to be identical with the printed text on the label
- **Compliance of the order of the Identifier:**
- **Supplier-ID** preceding **Package-ID** e.g. ...@V815@3SS123456789001...
- The Module width 0,34 mm (4 Dot/Mod)
- The classification of the code quality has to be min. grade B related to AIM-DPM and ISO 15415
- **Quiet Zone:** min. 1mm around the code