Marking of subsystems and single components ("S-Numbering")

Business Division GL

Guideline for external parties
Marking of subsystems and single components - Guideline
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Introduction/Motivation

Why is a marking of subsystems and single components necessary?

- A qualified saleable HELLA product passes several changes on single component and subsystem level from FirstOffTool-Parts (start of C-Sample process HELLA) until PPA/PPAP.
- For HELLA internal system integration planning, testing and logistics, every change level needs to be easy identifiable without being familiar to component and project.
- For this, every single product- as well as relevant process change is clearly reflected in a unique 11 digit part number (Sample-number), consisting of the initial 8 digit part number plus “Sxx”. Example: 218.507-01S01
- S-number to be applied on assembly groups and single components in accordance to drawing specification.

Example: S-Number xxx.xxx-Sxx
(4 dots) in the identification matrix on the surface of a single component
Marking of subsystems and single components - Guideline
General rules (1/2)

- Deviations, for example in case of sheet metal or very small parts, needs to be released by the Design Engineer and Manufacturing Engineer Tools&Components.

- The marking area in the tool needs to be easy accessible in order to have a simple/quick marking procedure.

- The marking of each component should be visible in end position in a subassembly.

- Letter “S” should be part of the marking, if possible.

- The marking should **not** be placed on rear side of decorative surfaces (e.g. high gloss or etched styling surface). In case of deviation, it needs to be released by tool expert.

- Location and matrix for S-numbers, as part of the geometrie are to be placed on the drawing and on 3D (RG). Specific DOT’s will not be shown on 2D(drawing) and 3D(RG).

- First DOT for xxx.xxx.xx-S01 to be placed with FirstOffTool-Parts.
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General rules (2/2)

- Single parts, which change level can get clearly identified via part number and revision level do not need an additional marking on the part itself. But for logistic reasons these parts do get a new S-Number in PDM/ERP with 1:1 relation to the rev. level. (see C-Sample process)

- PCBa do have an incremental series number and a 100 % correlation between Rev. and change level. Hence the S-number can clearly get identified without additional marking on the part itself.

- S-Numbers are communicated to external parties via each part order sheet, generated out of ERP automatically. Supplies and external parties have to follow this instruction.

- Each delivery note and packaging from external party have to state clearly the respective current S-Number – which is recorded on the purchasing order sheet, so that the HELLA income area of plant is able to check it easily.
Marking of single components - Guideline
Application type + ranking

Method ranking

1.) Rectangle matrix with punch marks (Standard)
   • 3x5 matrix
   • Size: 9mm x 20mm

2.) Flexible matrix with punch marks
   • Defined per drawing

3.) Rotatable insert (like data stamp)
   • Numbers: 0-9
   • Diameter: 4-6 mm (8 mm only for data stamp)
   • Remark: ‘1-12’ not allowed due to risk of confusion with date stamp

4.) a) Laser marking (Non preferred method)
   • After injection/production process
   • Remark: High equipment investment

   b) Adhesive label (Non preferred method)
   • After injection/production process
   • Remark: Attached by manual process and risk of detaching, outgassing

Marking sequence

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
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Shape alternative
Marking of single components - Guideline
Application type + ranking

If the number of fields in the matrix or the rotatable insert positions are not sufficient, it’s allowed to find an individual alternative solution (first choice is proposal below).

1. If every field is used...
2. ...a diagonal line can be added
3. Final possibility: Add diagonal line in opposite direction

This procedure triples the possible number of markings.
Marking of single components - Guideline
Example for S-number location/geometry on drawing/RG

Drawing/RG - Rectangle matrix for punch marks (Standard)

- S-number matrix
- Letter 'S' (Font: 1451 H3.5)
- 0.3 mm depth in the tool
- Square edge length: 3 mm
- Number of punch marks according to S number from purchased order

Catalog:
3D Elements -- PowerCopies/3D Elements/ 3D Parts inscriptions/ Inscriptions/S-Number Marking
Marking of single components - Guideline
Example for S-number location/geometry on drawing/RG

Drawing/RG - Flexible matrix for punch marks

Example:
→ xxx.xxx.xx-S03

Field S1, S2 and S3 need to be one punch mark.

RG (3D)

Pre-defined areas (surfaces)

Naming according to punch mark sequence
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Example for S-number location/geometry on drawing/RG

Drawing/RG - Rotatable insert (like data stamp)

- **S-number field with rotatable insert.**
- **Numbers:** 0 – 9
- **Diameter:** 8 mm, 6mm, 4mm (8 mm should be prefered)
- **Supplier:** According to tool specification (e.g. DME)
- **Type:** According to tool specification (e.g. UOR)
- **Letter 'S' (Font: 1451 H3.5) + frame**
- **0.3 mm deepened in the tool**

**Catalog:**
3D Elements -- PowerCopies/3D Elements/ 3D Parts inscriptions/ Inscriptions/S-Number Marking
Marking of single components - Guideline
Example for S-number location/geometry on drawing/RG

Drawing/RG - Laser marking / Label (not preferred solution)

- S-number: Laser marking or Label
- Font: 1451 H3.5
- Deepend/raised surface
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Further regulations for external parties, e.g. dimensional reports are included in tool specification for tool manufacturers:
• OS.05.0501.S.002 Thermoplas (former HF-1065-GL)
• OS.05.0510.S.002 Thermoset (former HF-1066-GL)

Different marking types are selectable (Remark: in case of thermosetting plastics rotatable inserts are not feasible)
Marking of single components - Guideline
Procedure during c-sample process

Rules for increasing S-number by HELLA

Following aspects leads to a new S-number during C-sample phase:

- Engineering change, initiated by HELLA or customer which leads automatically to a Revision level increase
- Necessary tool modification due to dimension still out of specification
- Revision level is increased
- Try-out with fundamental new parameters
- After tool transfer from tool shop to production

1: The project team (LDE and ME-TC/SQA TtM) decides if a S-number increase is reasonable.
A S-number increase is not intended for a parameter change during a parameter optimization loop.
Understanding S-Level

S-Level based on Tool/Process Optimizations and Form, Fit, Function Changes

Original design

Dimension not correct
Tool has to be optimized

Design Intent
Dimension changed (FFF)

REV. AA/S01

REV. AA/S02

REV. AB/S03

5.0
+0.1
-0.1

4.5

5.5
+0.1
-0.1

Should be 5, but is 4.5

FOTP
Tool has to be corrected,
same revision level AA
new S-

Next Frozen Zone
Tool has to be changed
new revision level AB
new S-

ECM = Engineering Change Management by HELLA

Hint: this S-# will also be documented in the CAD Model

Marking of single components – Guideline for external parties

Marking of single components - Guideline
Procedure during C-sample process

Rules for increasing S-number - -> Example
Marking of single components - Guideline
Order format for supplier communication

Ordering of new c-samples (single part or assembly group):

Parts with new S-number are directly ordered out of ERP System:

Change content with reference to revision level and corresponding drawing is automatically recorded in addition.

*Hint: S-Numbers are no longer part of MDS on the drawing !!*

Required S-Number for next production and delivery

Revision level and reference to the drawing

S-level description, text out of QTS - > PDM