Manual

7-character Part Number with Versioning

The following departments were involved in developing this manual:

- Development
- Management of Basic Data Part Lists
- Revision Services

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1 Introduction

By implementing the 7-character part number with versioning we want to make the traceability of parts more transparent, starting from the assignation of part numbers up to the process of series production. In order to make this easily comprehensible we described the most important terms and processes in the following.

The figure shows the origination process of a part, starting from the draft phase up to the release for series production.

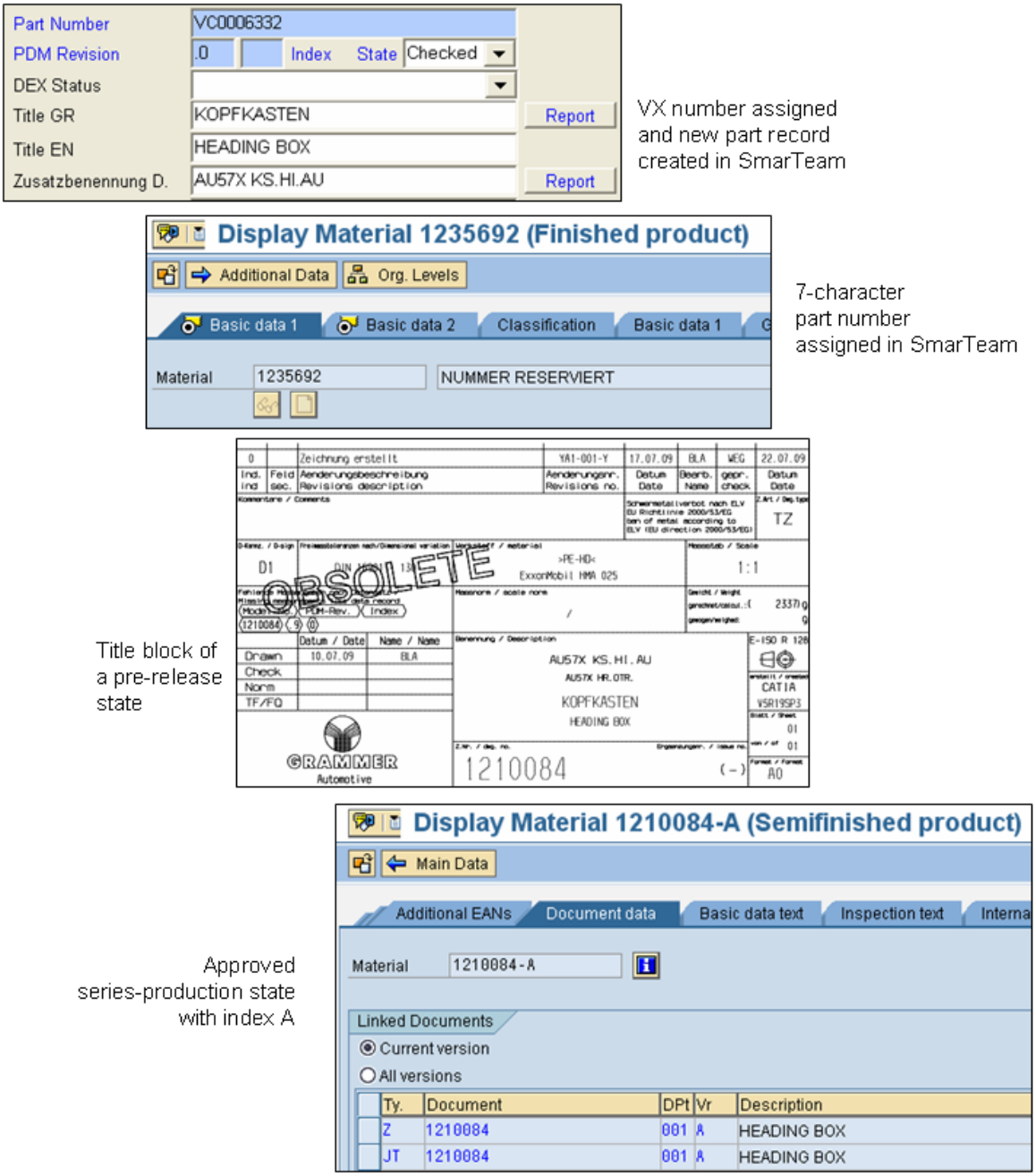


Figure 1: Origination process of a part in SmarTeam and SAP

2 The Standard GRAMMER Title Block

Since April 2011, there is a standard GRAMMER title block used across the group to cover the needs of **Automotive** and **Seating**. The field for **Index (Versioning)** is highlighted in blue and written in a bigger font size.

This new title block **has to be used** for new models, and should replace the old one if pre-release data or revisions to the series production are already available.

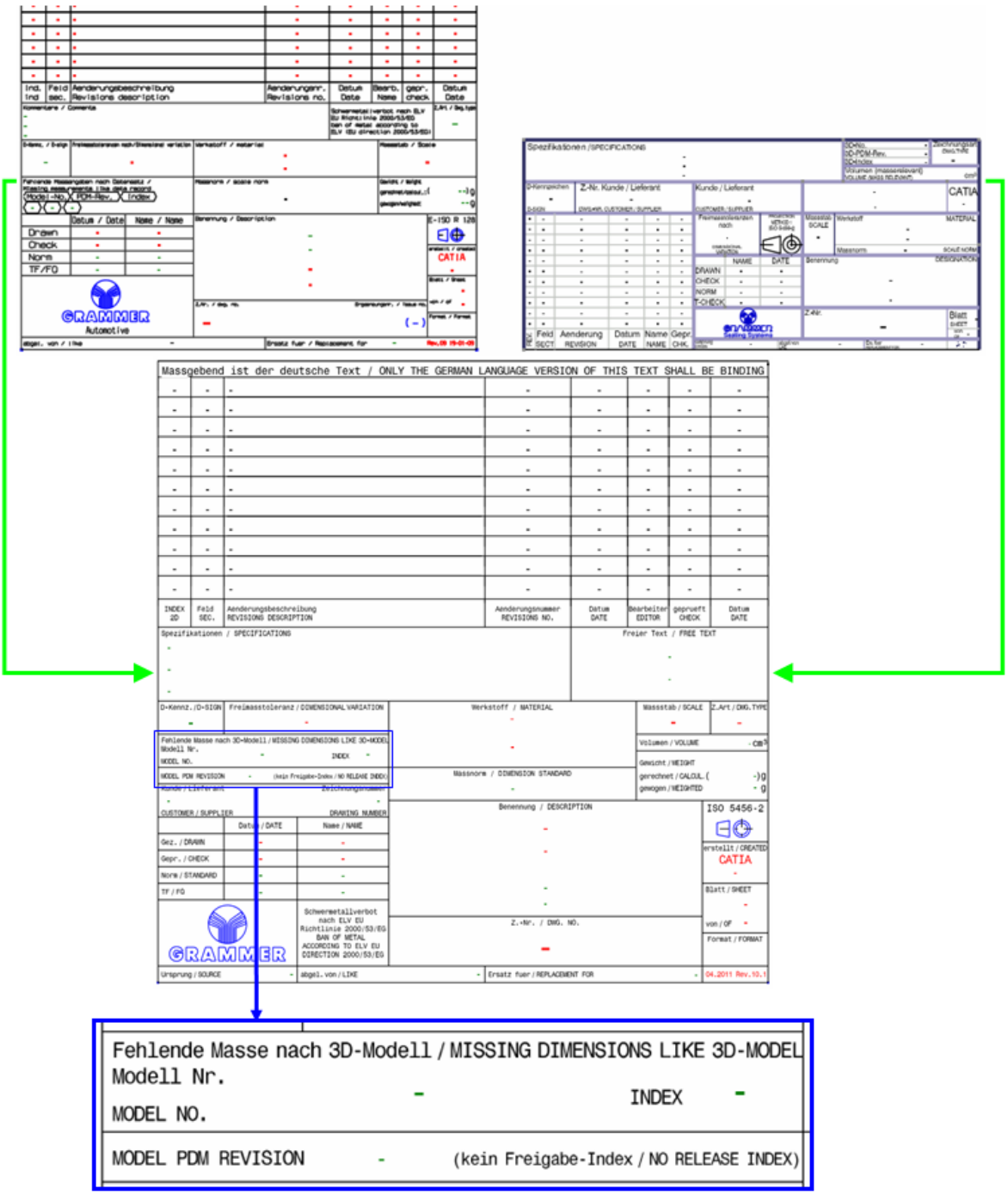


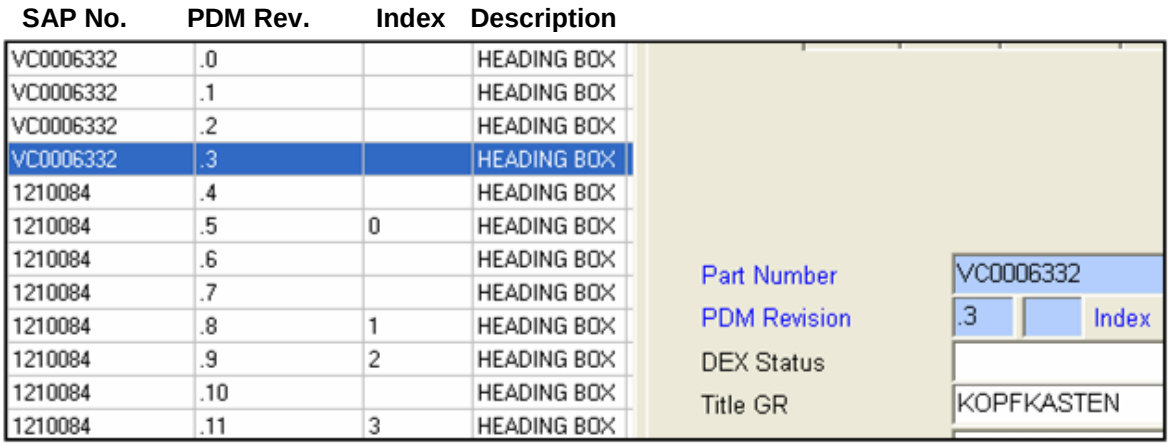
Figure 2: New title block used across the group

3 Part Number, Index, and Description in SmarTeam

3.1 VX Numbers

The description of all products, parts, and drawings in SmarTeam consist of:

- 9-character VX number
- PDM Revision (states of engineering from .0 to .99 only)
- index (these states do **not** appear in SAP from 01 to 99)
    - *before the implementation with Versioning (until December 31, 2009) from 0 to 99*
- description (always complies to the SAP Name Database)
- last date of saving (for export of data files only)
- engineer's acronym (for export of data files only)
- file format (for export of data files only)



SAP No.	PDM Rev.	Index	Description
VC0006332	.0		HEADING BOX
VC0006332	.1		HEADING BOX
VC0006332	.2		HEADING BOX
VC0006332	.3		HEADING BOX
1210084	.4		HEADING BOX
1210084	.5	0	HEADING BOX
1210084	.6		HEADING BOX
1210084	.7		HEADING BOX
1210084	.8	1	HEADING BOX
1210084	.9	2	HEADING BOX
1210084	.10		HEADING BOX
1210084	.11	3	HEADING BOX

Figure 3: VC Number, PDM Revision, Index, and Description in SmarTeam

VX numbers:

- are consecutive and automatically generated by SmarTeam
- are never transferred to SAP
- can also be blocked by a **V Number Workflow** to record the dataset
- can not be traced in concepts

- **later become 7-character SAP numbers while indexes (PDM Revision and Index) continue**

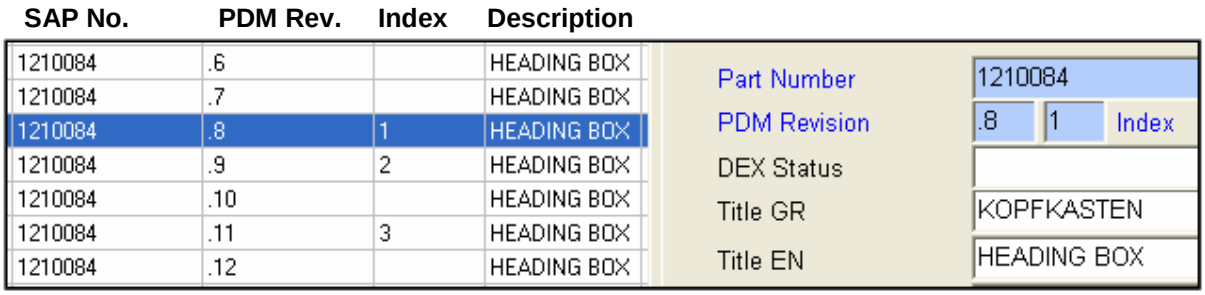
Which VX number indicates which site?

VA for data generated in Haselmühl
VB for data generated in Detroit
VC for data generated in Immenstetten
VD for data generated in Tianjin
VE for data generated in Hudson
VF for data generated in Bursa
VG for data generated in Bangalore
VH not assigned yet
VI for data generated in Langenfeld
VK for data generated in Atibaia

3.2 7-character SAP Numbers

The description of all products, parts, and drawings in SmarTeam consist of:

- 7-character SAP number
- PDM Revision (states of engineering from .0 to .99 only)
- index (these states **always** appear in SAP from 01 to 99, too)
    - *before the implementation with Versioning (until December 31, 2009) from 0 to 99*
- description (always complies to the SAP Name Database)
- last date of saving (for export of data files only)
- engineer's acronym (for export of data files only)



SAP No.	PDM Rev.	Index	Description
1210084	.6		HEADING BOX
1210084	.7		HEADING BOX
1210084	.8	1	HEADING BOX
1210084	.9	2	HEADING BOX
1210084	.10		HEADING BOX
1210084	.11	3	HEADING BOX
1210084	.12		HEADING BOX

Figure 4: 7-character Part Number, PDM Rev., Index, Description in SmarTeam

The 7-character SAP number:

- can be generated in SmarTeam directly via SAP interface using "New from SAP", or you enter an available SAP number which does not exist in SmarTeam yet.
- can be supplemented in SmarTeam by various add-ons in front or after the part number (e.g. RF_ , _REF , _EBx , _SZ , _ACP ,)
- Datasets with add-ons will **not** be transferred to SAP.

- appears **in SmarTeam without Index** but **in SAP always with the hyphenated Index**

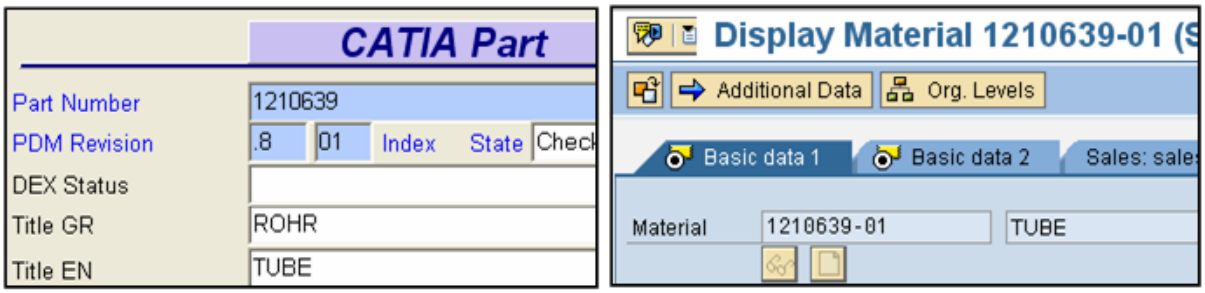


Figure 5: Contrast between SmarTeam and SAP

3.3 Dataset Description after the Export from SmarTeam

The unique assignation of the datasets in SmarTeam takes place only by:

- part number
- PDM revision
- index

In SmarTeam, file names are "without date and engineer's name".

The description, the last saving date, and the engineer's acronym will not be added until the readout with the command "DEX" (data exchange).

The data can be readout depending on the customer requirements by using the respective OEM profile.

```
1210084_____4_____HEADING_BOX_____170709_BLA__.pdf (2D)

1210084_____19____2_____HEADING_BOX_____051009_BLA__.CATPart
1210084_____9_____2_____HEADING_BOX_____051009_BLA__.CATDrawing

1210084_____34____9_____HEADING_BOX_____260310_BLA__.stp
1210084_____20____10____HEADING_BOX_____260310_BLA__.pdf
1210084_____21_____HEADING_BOX_____111110_BLA__.dxf

1210084_____A_____A_____HEADING_BOX_____161210_BLA__.igs
1210084_____A_____A_____HEADING_BOX_____161210_BLA__.tif
```

Figure 6: Dataset description after the export with the GRAMMER profile

The customer's dataset description is generated automatically by DEX and can be clearly assigned to a SmarTeam dataset. The reference to the SmarTeam data results from the part number, the PDM revision and the index (here in the case of VW).

```
4G0_885_973____G02_TMG_001_____HEADING_BOX_____VC0006332_0_____.CATPart
4G0_885_973____G02_TMG_001_____HEADING_BOX_____VC0006332_0_____.CATDrawing
4G0_885_973____G02_TMG_001_____HEADING_BOX_____1210084_4_____.pdf (2D)

4G0_885_973____G02_TMG_001_____HEADING_BOX_____1210084_19___2_____.CATPart
4G0_885_973____G02_TMG_001_____HEADING_BOX_____1210084_9____2_____.CATDrawing

4G0_885_973____G02_TMG_001_____HEADING_BOX_____1210084_34____9_____.stp
4G0_885_973____G02_TMG_001_____HEADING_BOX_____1210084_20____10____.pdf
4G0_885_973____G02_TMG_001_____HEADING_BOX_____1210084_21_____.dxf

4G0_885_973____G02_TMG_001_____HEADING_BOX_____1210084_a_____a_____.igs
4G0_885_973____G02_TMG_001_____HEADING_BOX_____1210084_a_____a_____.tif
```

Figure 7: Dataset description after the export with the VW profile

3.4 Number reserved / Initiate Workflow

The entry "Number reserved" in SAP is created if an engineer reserves a number in SmarTeam using "New from SAP". The "generator" can only be traced with SmarTeam.

Figure 8: Number reserved

After the successful pre-release workflow or approval workflow the text "Number reserved" will be overwritten by a SAP description and the part number will be versionised. In the example it becomes **1241977-01**.

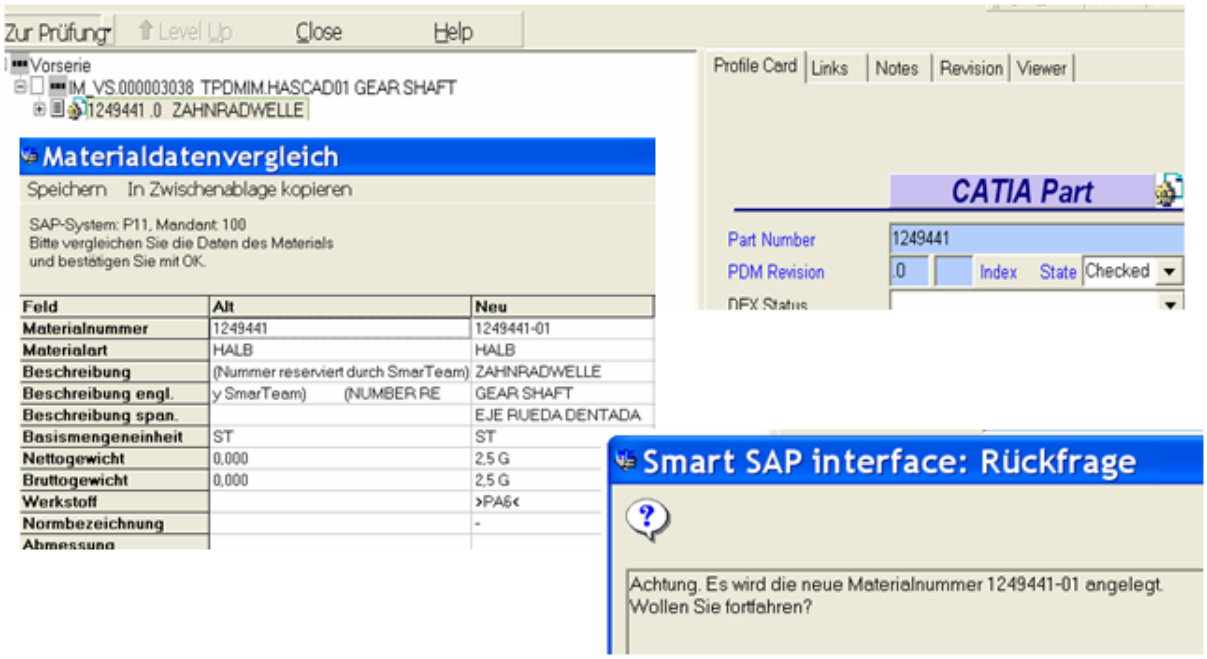


Figure 9: Versioning during a workflow

4 Formalities for Drawings

4.1 How do you read a drawing?

The following information always occurs in the title block of each drawing:

- part number and index from 3D and 2D
- PDM revision only from 3D

Example:

- In the **drawing** 1210084 with the **index 2**, you can see the **3D state** 1210084 **.29 7**.
- In the **drawing** 1210084 with the **index a**, you can see the **3D state** 1210084 **a a**.

Please Note: *The double letters are explained in 6.1.*

Figure 10: Pre-release drawing from GRAMMER title block

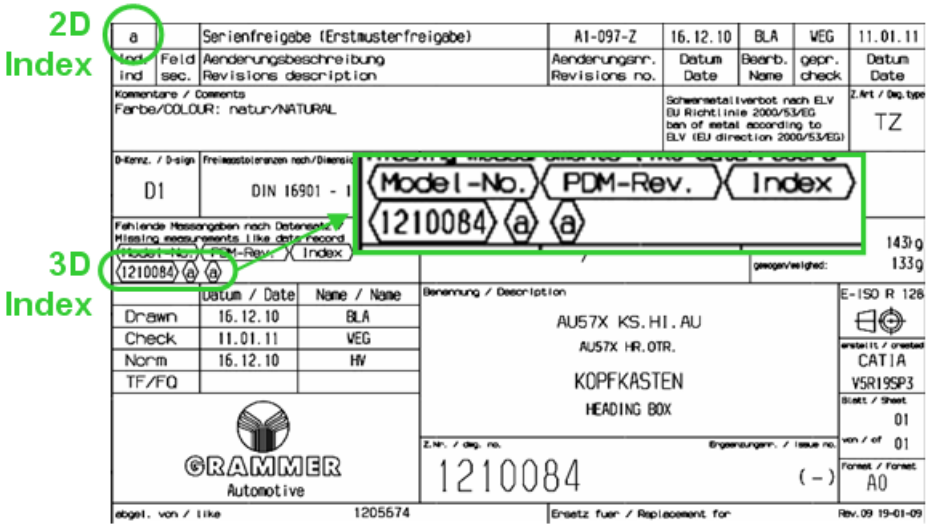


Figure 11: Series-production drawing from GRAMMER title block

4.2 What is not allowed on a drawing?

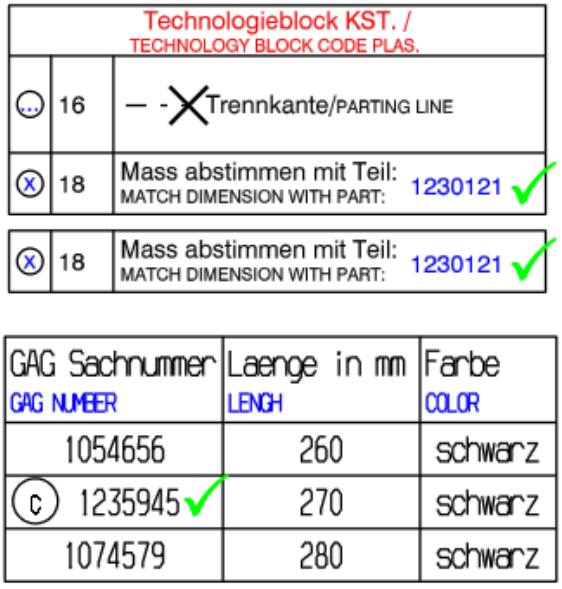
Do not mention the 7-character part number with versioning on the drawing under any circumstances!

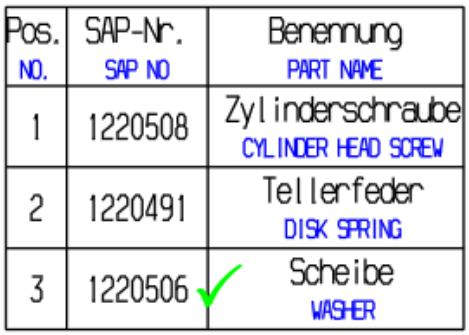
The index of the part or the assembly,

- during the pre-release or when current revisions are made, can be seen in the engineering list and the engineering state list or in SAP.
- The SAP parts list shall be binding during the series production.

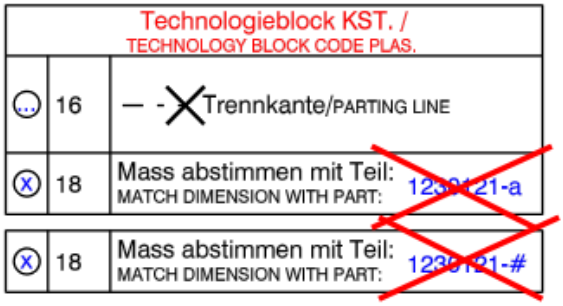
When ordering parts, you have to add a valid engineering state list or a SAP parts list so that the part number with versioning can be clearly assigned.

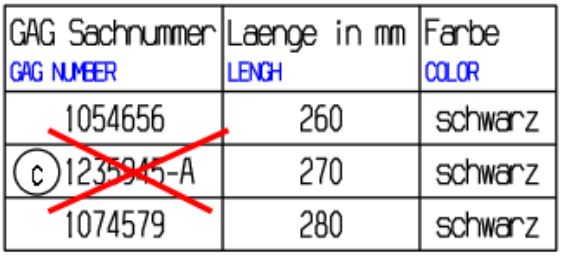
Correct

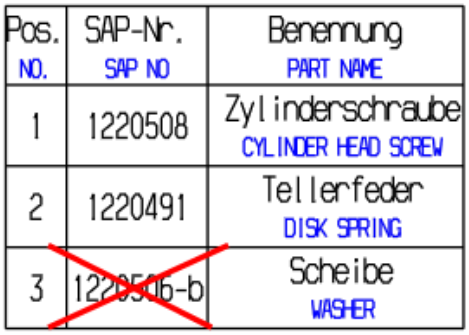




Incorrect







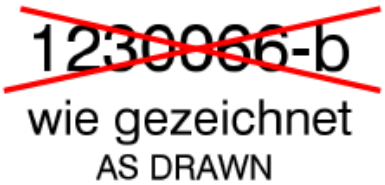


Figure 12: Entries that are not allowed

4.3 Which rubber stamps could appear on the drawing?

4.3.1 Rubber stamps in SmarTeam during the pre-release

- PRE-RELEASE IN MODIFICATION
  - In this state, there is only a PDM revision but no index.
- OBSOLETE
  - There is a newer index in SmarTeam and SAP for this state.
- PRE-RELEASE
  - This state was transferred to SAP during a pre-release workflow.

Figure 13: Rubber stamps in SmarTeam during pre-release

4.3.2 Rubber stamps in SmarTeam during the series production

- "no rubber stamp": There is a production release for this part and a newer state does not exist.
  - Text of revision:
    - for Automotive "PRODUCTION RELEASE (first article release)"
    - for Seating "NEW DRAWING"

- OBSOLETE
  - There is a newer index in SmarTeam and in SAP for this state.

- IN MODIFICATION
  - This state appears in a series-production revision.

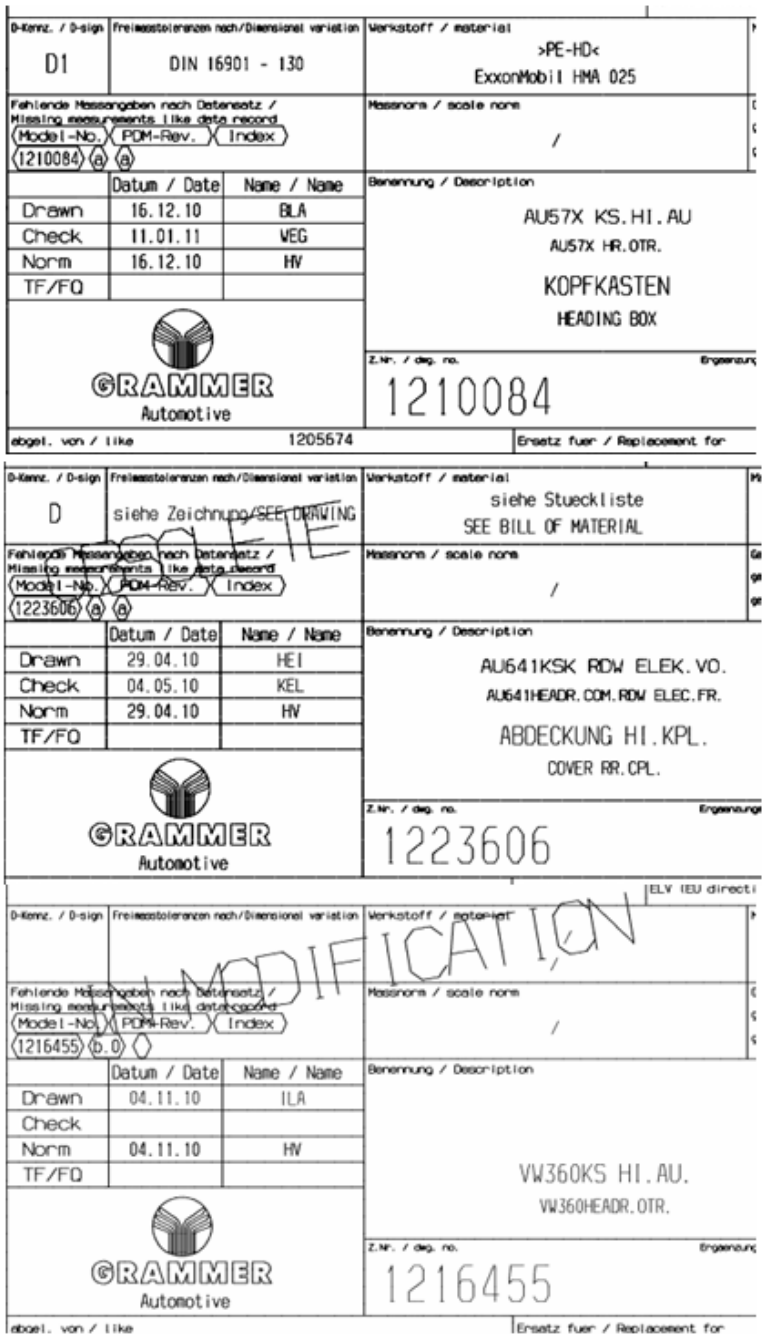


Figure 14: Rubber stamp in SmarTeam during series production

4.3.3 Rubber stamps in SAP

Although SAP differentiates between “provisionally”, “approved”, “in revision”, and “invalid” there is only one rubber stamp.

- A provisionally state has a PRE-RELEASE rubber stamp from SmarTeam.
- An approved state has no rubber stamp.
- A state in revision has no rubber stamp.
- An invalid state has the rubber stamp **"invalid" (ungueltig)**.

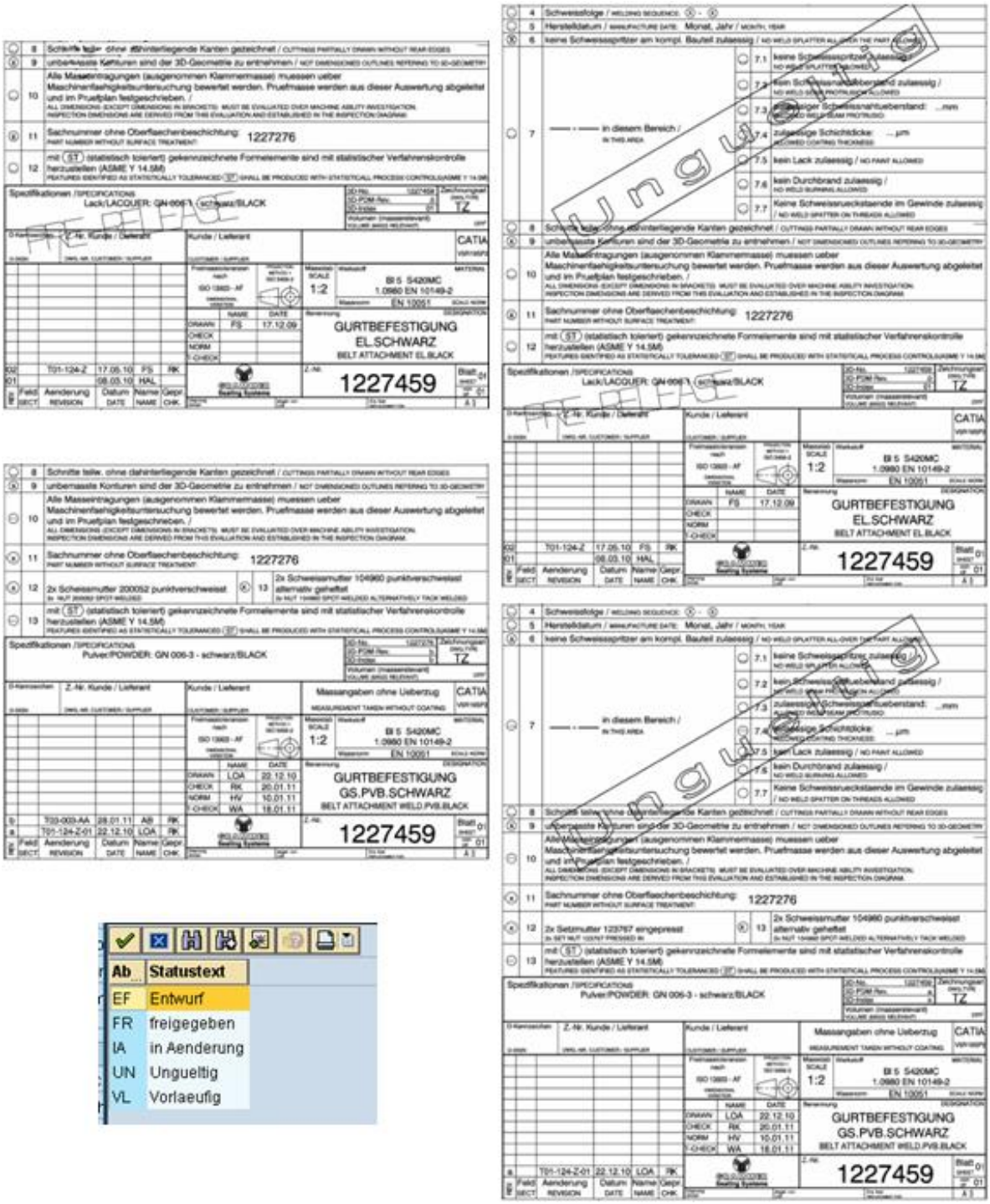


Figure 15: Rubber stamp in SAP

5 The Tool Index and the SmarTeam Index

5.1 Which index applies to the tool and how does it look like?

The 3D index always applies to the tool and is always clearly separated from the part number. Only states with a 3D index and the corresponding 2D index shall apply to the tool. States with 3D PDM revision only or without a 2D index are not allowed to be delivered as tool state. Before delivery at the latest, there has to be a drawing with index at the supplier's.

	3D part		2D drawing		
ID no.	PDM revision	Index	PDM revision	Index	out-of-tool part or not
1210084	.16				no 3D index available, no part available
1210084	.19	**2**	**.9**	**2**	3D and 2D index available, part available
1210084	.29	**7**	**.17**		no 2D index available, no part available
1210084	.29	**7**	**.18**	**8**	3D and 2D index available, part available

Figure 16: Possible part states

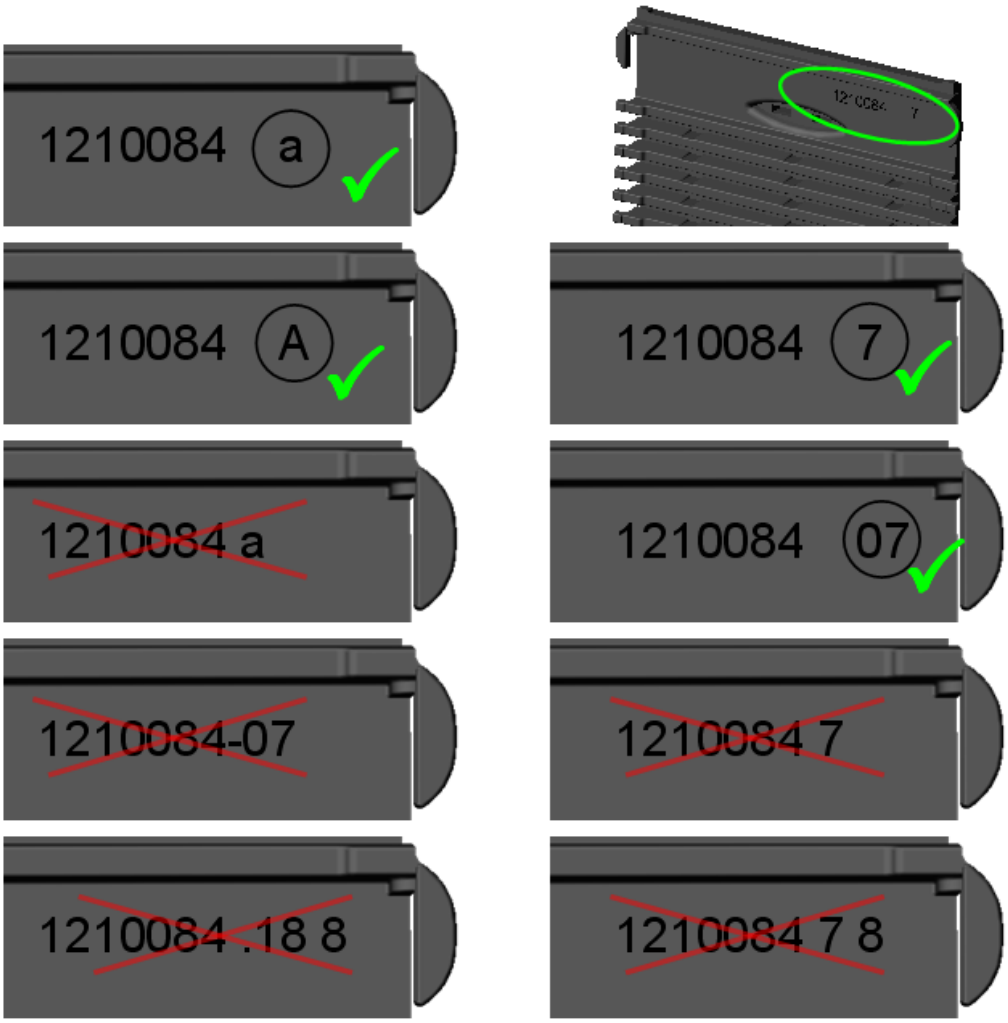


Figure 17: Part description in a tool

5.2 How should the index be applied to the tool?

The index is not a part of the part number and this has to be clearly recognizable on the tool.

The index has to be applied as follows (only a **suggestion** and not necessarily exhaustive):

- to plastic parts
  - on ejector
  - as exchangeable inset
  - as index field with staking punches

- to foam parts
  - as exchangeable inset
  - as rubber stamp

- to metal parts
  - as exchangeable inset
  - as engraving

- to small parts and standard parts
  - on the packing
  - colour-coded

5.3 When is the index in SmarTeam and in the tool upgraded?

The index in SmarTeam can be upgraded in order to

- document the state
- replace the text "Number reserved" in SAP by the description
- display data in SAP to all
- send a state to the client or the supplier
- start a tool
- initiate a tool revision
- conclusively document an engineering state
- document a revision
- document a milestone in the project
- limit the tolerance in the drawing → new 3D index if mixed engineering is not allowed

- not necessarily exhaustive

An index upgrade in SmarTeam is only possible in connection with a workflow.

Responsible for the upgrade of the index is,

- during the **pre-release, only** the **project team**.
- during the **series production,** the **Revision Services** together with the **project team**.

6 Data Management for Series Production

6.1 Approval State for Series Production

If a part number goes into series production, the first index will be a, the next state will be b, and so on.

The double letters in series-production states in SmarTeam are determined by the system and both letters are without exception always the same.

Nonetheless, there is only one index in SAP.

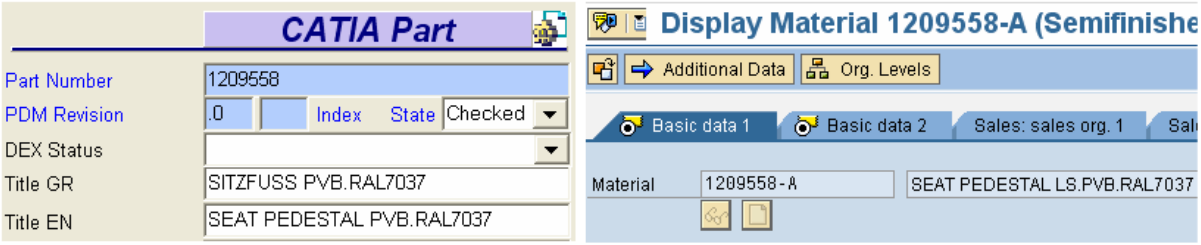


Figure 18: Approval state for series-production Index a

6.2 Series-production Revisions

If a series-production revision process is initiated, the PDM revision automatically upgrades by one letter and receives the add-on .0.
The state will be .1, and so on until the part with the next double letter is approved.

Example:

- A revision process of state f f is initiated.
- A new version of state f f is created which receives automatically the add-on g.0.
- The state is saved as g.0 after the check-in.
- g.0 becomes g.1 at the check-out / check-in.
- g.1 becomes g.2 at the check-out / check-in.
- g.2 becomes g.3 at the check-out / check-in.
- g.3 becomes automatically g g after the revision workflow has been finished.

SAP-No.	PDM Rev.	Index	Description	Revision No.
1118886_SZ	f	f	SUSPENSION UPPER PART WELDED EL.BLACK	T01-575-V
1118886_SZ	g.0		SUSPENSION UPPER PART WELDED EL.BLACK	T01-283-W-04
1118886_SZ	g.1		SUSPENSION UPPER PART WELDED EL.BLACK	T01-283-W-04
1118886_SZ	g.2		SUSPENSION UPPER PART WELDED EL.BLACK	T01-283-W-04
1118886_SZ	g	g	SUSPENSION UPPER PART WELDED EL.BLACK	T01-283-W-04
1118886_SZ	h	h	SUSPENSION UPPER PART WELDED EL.BLACK	T01-583-WW
1118886_SZ	j	j	SUSPENSION UPPER PART WELDED EL.BLAC	T01-255-X

Figure 19: Series-production revision

6.3 Inventory Data from other Systems

When migrating already approved CAD series-production data in SmarTeam (Migration) please note:

Data (2D and 3D)

- **are never allowed to be linked to a workflow. Otherwise they will be versionised.**

- have to be approved manually by a SmarTeam administrator.
- are approved with the currently valid index.
- can be transferred to SAP but without the index.
- have to meet the customer's and the GRAMMER standard.

The drawing

- has to be stored in SAP meeting the customer's and the GRAMMER standard.
- has to have a test report of the first article with mark 1 in SAP.

This applies to data from the following systems:

- Catia V4
- Catia V5 Filesystem
- Ideas
- UG
- Euclid

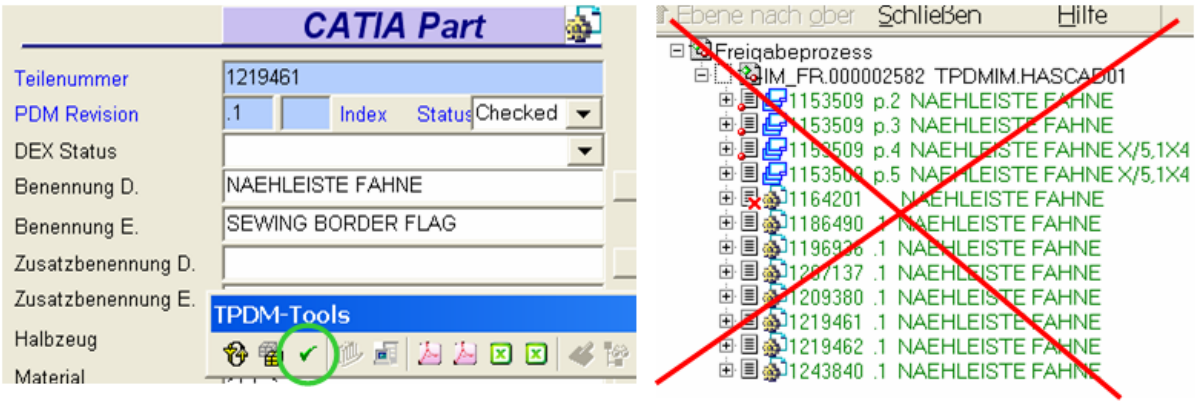


Figure 20: Manual approval

7 How to read the Index and the Links in SmarTeam

7.1 2D Index and corresponding 3D Index

Example 1:
The index during the first initiation of a VNumber workflow or a pre-release workflow is the **same** because the drawing is approved together with the 3D.

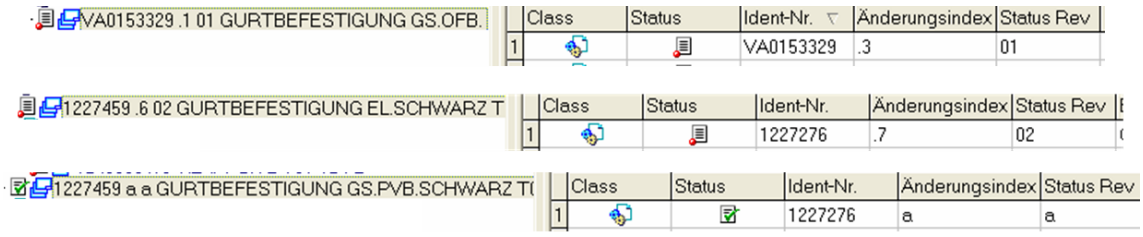


Figure 21: 2D index and 3D index are the same

Example 2:
In most cases, the 2D index is higher than the 3D index because if just the drawing is modified, only the 2D index is **upgraded**.

During the series-production approval both are aligned to a a again provided that 3D and 2D are sent to the approval workflow at the same time. (Exceptions could be the collective drawings of standard parts.) They can differ again after the next revision took place.

	3D part		2D drawing		
ID no.	PDM revision	Index	PDM revision	Index	Description
1210084	.18	01	.8	01	both the same
1210084	.27	06	.15	06	both the same
1210084	.32	08	.19	09	2D upgraded
1210084	a	a	a	a	both the same
1210084	a	a	b	b	2D upgraded

Figure 22: 2D index higher than 3D index

Example 3: ONLY POSSIBLE IN PRE-RELEASE
Actually, the drawing index should **never be smaller** than the 3D index although this could be the case. You should not allow pure 3D approvals without 2D approvals even if this is possible.

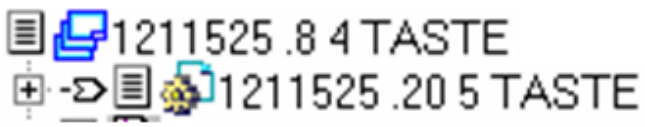


Figure 23: 3D index higher than 2D index

7.2 2D Example for a Drawing

The basis is the drawing.

The drawing with the PDM rev. 10 is linked to the 3D with the PDM rev. 4 and the index 02.

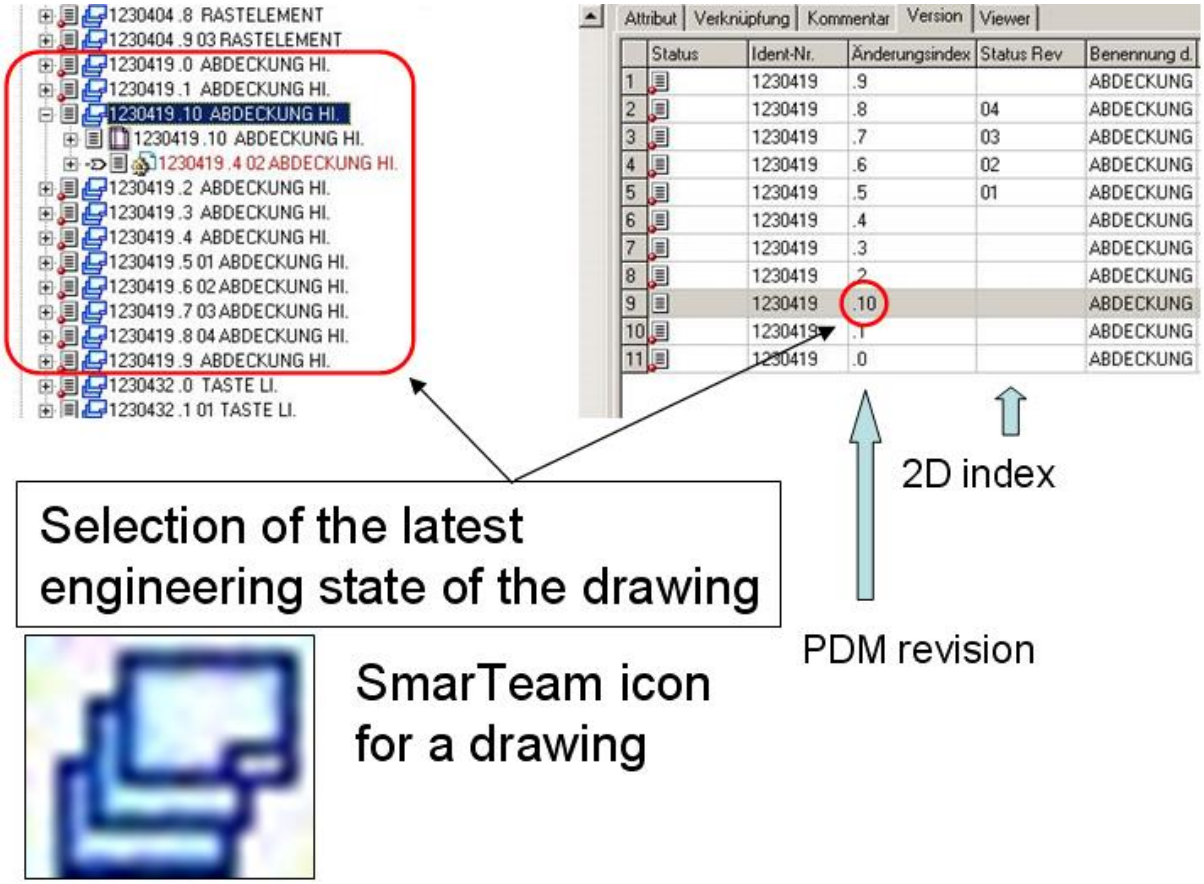


Figure 24: Link between 2D and 3D entry

7.3 3D Example for a CATIA Part

The basis is the 3D part.

The 3D with the PDM rev. 4 and the index 02 is linked to the drawing with the PDM rev. 10.

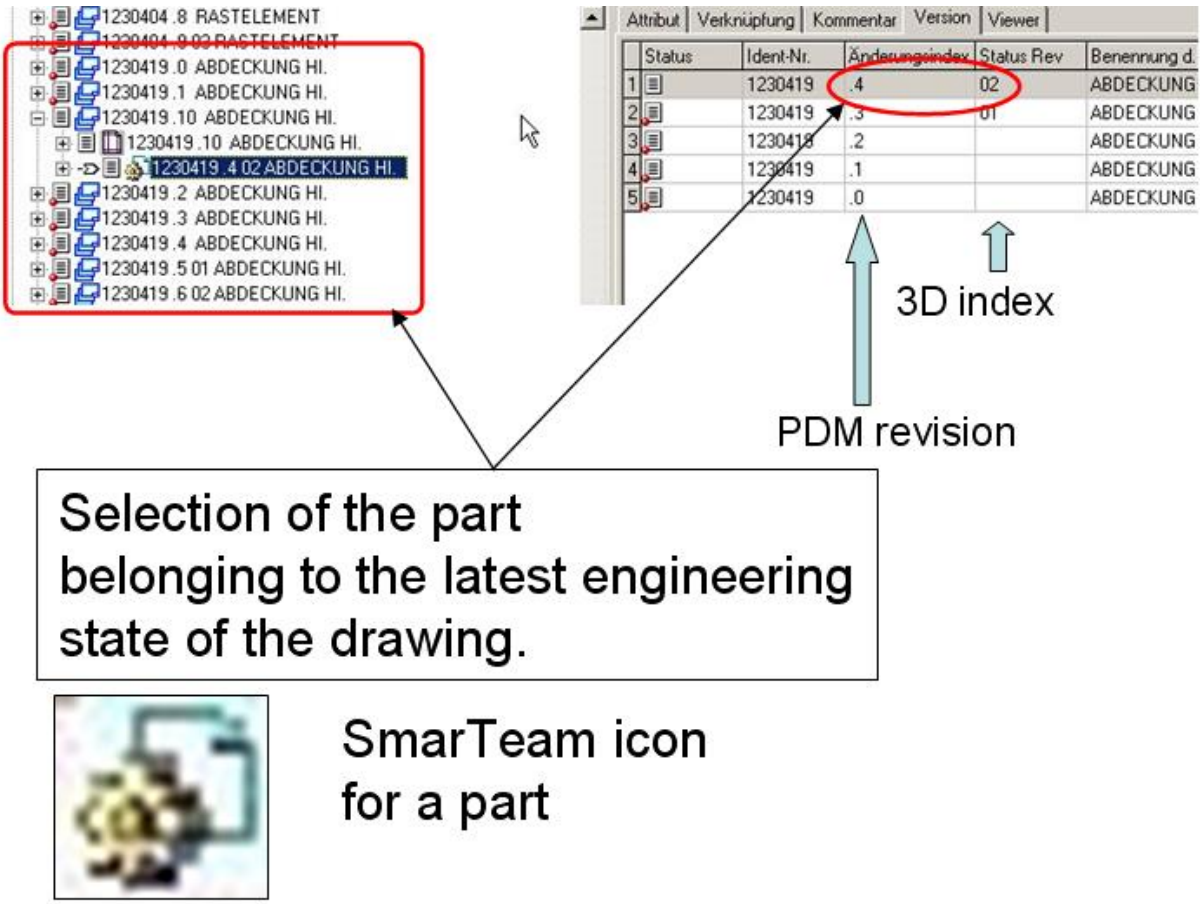


Figure 25: Link between 3D and 2D entry

7.4 2D and 3D Summary

On the chart you can see all links and indexes between 3D and 2D during the whole engineering process of the part.

	3D CATIA Part		2D CATIA Drawing		
Ident-Nr.	PDM-Rev.	Index	PDM-Rev.	Index	Änderungstext
VC00063	.0		.0		ohne Text
VC00063	.1				o.Z.
VC00063	.2				o.Z.
VC00063	.3				o.Z.
VC00063	.4		.1		Zeichnung erstellt
VC00063	.5		.2		Zeichnung erstellt
VC00063	.6		.3		Zeichnung erstellt
VC00063	.7				o.Z.
1210084	.8		.4		Zeichnung erstellt
1210084	.9	0	.5	0	Zeichnung erstellt
1210084	.10				o.Z.
1210084	.11				o.Z.
1210084	.12				o.Z.
1210084	.13		.6		Aussengeometrie geaendert
1210084	.14				o.Z.
1210084	.15				o.Z.
1210084	.16				o.Z.
1210084	.17		.7		Aussengeometrie geaendert
1210084	.18	1	.8	1	Aussengeometrie geae.; Rippe hinzu; Fuehrung
1210084	.19	2	.9	2	Rippen geaendert
1210084	.20		.10		Sicherheitsradius hinten geaendert
1210084	.21				o.Z.
1210084	.22	3	.11	3	Sicherheitsradius hinten geaendert;Uebernahme1
1210084	.23		.12		Mindestradius vorne unten geaendert
1210084	.24				o.Z.
1210084	.25	4	.13	4	Mindestradius vo unten geaendert; f. Werkzeug opt.
1210084	.26	5	.14	5	Stiftlochdurchmesser geaendert
1210084	.27	6	.15	6	Stiftaufnahme,Innenradius Sicherheitsradius geae.
1210084	.28				o.Z.
1210084	.29	7	.16	7	Abzugskoerper fuer Schaumteil geaendert
1210084	.29	7	.17		ohne Text
1210084	.29	7	.18	8	Zeichnungsaenderung
1210084	.30				o.Z.
1210084	.31				o.Z.
1210084	.32	8	.19	9	Leistenkanal geaendert; angeglichen an PB
1210084	.33				o.Z.
1210084	.34	9	.20	10	Radien Haltestangenaufnahme hinzu
1210084	.34	9	.21		Zeichnung mit Messbericht abgeglichen
1210084	a	a	a	a	Serienfreigabe (Erstmusterfreigabe)
1210084	a	a	b	b	Zeichnungstoleranzen nach EMPB angepaßt
1210084	b	b	c	c	Bereich der Stangenaufnahme geändert

Figure 26: 2D and 3D summary

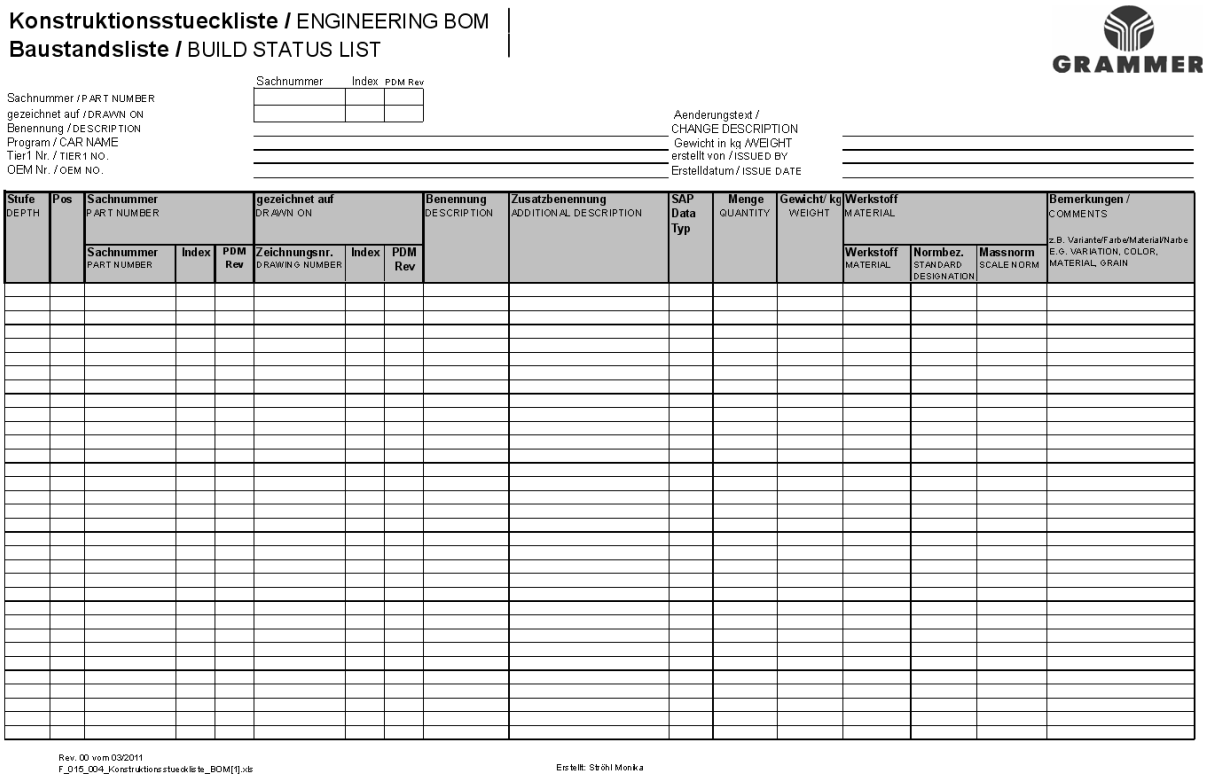
8 Engineering Parts List / Engineering State List

The F_015_004_ENGINEERING_BOM.xls is in GBS and can be generated automatically in SmarTeam using the Excel or pdf icon.

Relevant pieces of information are transferred from the profile chart to the parts list and then read out.

Note: The parts list can only be derived from a Catia product.

Figure 27: Toolbar parts list



Konstruktionsstueckliste / ENGINEERING BOM
Baustandsliste / BUILD STATUS LIST

GRAMMER

	Sachnummer	Index	PDM Rev
Sachnummer / PART NUMBER			
gezeichnet auf / DRAWN ON			

Benennung / DESCRIPTION
Program / CAR NAME
Tier1 Nr. / TIER1 NO.
OEM Nr. / OEM NO.

Aenderungstext / CHANGE DESCRIPTION
Gewicht in kg /WEIGHT
erstellt von / ISSUED BY
Erstelldatum / ISSUE DATE

Stufe DEPTH	Pos	Sachnummer PART NUMBER			gezeichnet auf DRAWN ON			Benennung DESCRIPTION	Zusatzbenennung ADDITIONAL DESCRIPTION	SAP Data Typ	Menge QUANTITY	Gewicht/ kg WEIGHT	Werkstoff MATERIAL			Bemerkungen / COMMENTS
		Sachnummer PART NUMBER	Index	PDM Rev	Zeichnungsnr. DRAWING NUMBER	Index	PDM Rev						Werkstoff MATERIAL	Normbez. STANDARD DESIGNATION	Massnorm SCALE NORM	z.B. Variante/Farbe/Material/Narbe E.G. VARIATION, COLOR, MATERIAL, GRAIN

Rev. 00 vom 03/2011
F_015_004_Konstruktionsstueckliste_BOM[1].xls

Erstellt: Ströhl Monika

Figure 28: Engineering parts list as an Excel chart

9 Interface between a CAD Engineer and Other Departments

As the part will be versionised and the SAP index will be upgraded by initiating a workflow this process has to be coordinated in advance and timed within the project team. This is the only way to avoid unnecessary expenses and the waste of time of the participants.

9.1 Input Information for the CAD Engineer

By the project team:

- Will the part be coloured or plain?
- Will the part be delivered to the customer directly or not?
- pattern parts list of the customer
- GRAMMER intern pattern parts list
- realistic timeline for revision
- other important information

9.2 Output Information from the CAD Engineer

For the project team:

- After the workflow has been finished the CAD engineer has to e-mail the latest engineering parts list or engineering state list → only for Automotive
- After the workflow has been finished the parts list will be transferred automatically to SAP and the CAD engineer hat to e-mail these information → only for Seating
- Now, all the other departments can access the data.

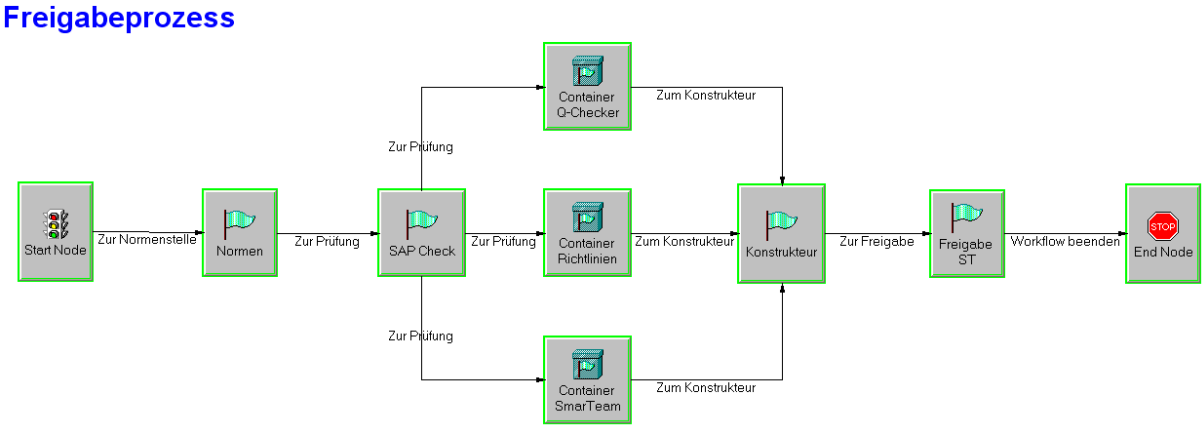


Figure 29: Flow process chart of a finished approval workflow

10 Interface to SAP

10.1 Interface to SAP during Workflow

During a pre-release workflow and an approval workflow the details from the **material data comparison** will be transferred to SAP directly.
If there is no calculated weight (net weight) given by SmarTeam, it is compulsory to enter a weighted weight (gross weight) because otherwise the part does not weigh "anything" in SAP
Exception: It is a SZ or ZB without weight specification.

Figure 30: SmarTeam SAP Tool material data comparison

Feld	Alt	Neu
Materialnummer	1095074-01	1095074-A
Materialart	ZCHN	ZCHN
Beschreibung	SZ_ NAEHLEISTE HAKEN 16X3,2	SZ_ NAEHLEISTE HAKEN 16X3,2
Basismengeneinheit	ST	ST
Nettogewicht	0.005	0,005
Bruttogewicht	0.005	
Werkstoff	>PP<	>PP<
Normbezeichnung	/	/
Dokument	1095074	1095074
Dokumentart	SZ	SZ
DokVersion	01	
DIN-Format	A3	A3
Blattanzahl	001	1
Beschreibung engl.	SZ_ SEWING BORDER HOOK 16X3,2	SZ_ SEWING BORDER HOOK 16X3,2

Figure 31: Transfer to SAP

10.2 SAP Search for 7-character Number with Versioning

When searching in SAP (MM03 - Material & show) for a number with versioning you have to enter a ***** **after the number** in the field **Material No./Short Text** in order to find the **latest** version. Otherwise, you will get a wrong output.

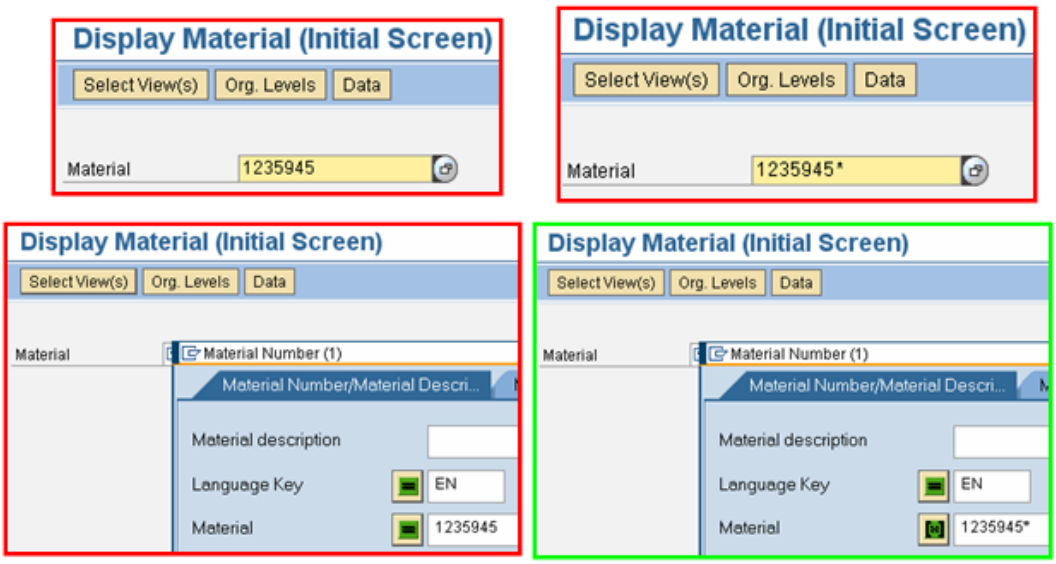


Figure 32: Search for a number with versioning in SAP

11 Revision Services, Revision Request, and Revision Number

You get more information concerning the proceedings from the department directly.

12 Management of Basic Data Part Lists

You get more information concerning the proceedings from the department directly.

13 Effective Documents / Revisions

Name	Date	Revision