# Work Instruction

**015 Research + Development**

**SmarTeam Workflow**

**W_015_003**

| *Rev.* | *Date* | *Originator / Author* | *Date* | *Approver* | *Date* | *Releaser* | *Date* |
|---|---|---|---|---|---|---|---|
| 00 | 30.01.2014 | Dietz Markus | 15.11.2013 | Ströhl Monika | 16.12.2013 | Kammerer Georg | 23.01.2014 |
| 01 | 25.06.2015 | Kaiser Bettina | 16.06.2015 | Ströhl Monika | 23.06.2015 | Holzner Martin | 23.06.2015 |
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## 1 Purpose

The purpose of this work instruction is to optimize the management and quality of the data generated by CATIA V5 / *NX* at GRAMMER. A uniform procedure and structure for data management is intended to increase efficiency in the application of SmarTeam in combination with CATIA V5 / *NX*. Moreover, data should be created using the new, uniform procedure and also structured and managed in such a way that its usability within the process chain is ensured. The subsequent processes shall draw the maximum benefit from the data provided.

## 2 Scope

This work instruction applies to all GRAMMER Group companies as well as to external partners that are part of the GRAMMER Group's design/development process and create data for the GRAMMER Group in this context or provide the GRAMMER Group with such data.

This work instruction contains specifications for data generation and management using the *Team Data Management* system SmarTeam in connection with the CAD system CATIA version 5 (CATIA V5) / *NX* in the GRAMMER Group's Design department. This work instruction also applies to all departments within the GRAMMER Group that are involved in the PLM process.

This work instruction as well as the methods and procedures described in it shall also apply to customer projects unless replaced completely or in part by separate agreements. *For this an arrangement with office C-RD7-DE9 is necessary.*

Upon entering into force, this work instruction shall replace all previously valid work instructions / directives on this subject. The following applies to the application of the new work instruction and the expiry of the previous work instruction:

- For “ongoing old projects”, the rules specifically defined for that project shall apply. If such rules are missing completely or in part, this work instruction shall apply where necessary.

- If there are definition gaps, in case of doubt the rules applicable up to now as well as implemented methods shall apply in these situations.

# 3 Terminology

CATIA/*NX*/SmarTeam-specific descriptions of functions are written in italics.

Workflow A predefined sequence of activities that can be recorded by, among other things, a PDM system (SmarTeam in this case) in digitised form to support the process.

SmarTeam Software for managing CAx data

PDM Product Data Management system

PLM Product Lifecycle Management

Viewer Software for viewing 2D images and 3D representations

Redlining A functionality in image viewing software that allows annotations and markings to be added to existing illustrations without having to change the original illustration. This allows end users to furnish illustrations with notes. (Application example: SmarTeam workflow)

RMB Abbrev.: **R**ight **M**ouse **B**utton -> to access shortcut menus, for example

LMB Abbrev.: **L**eft **M**ouse **B**utton -> e.g. for selecting objects

CAx Data Umbrella term for data/files created in a **c**omputer-**a**ided system, e.g. CATIA */NX*.

CATPart CATIA V5 part (single part)

*NX Part* *NX part (single part)*

CATProduct CATIA V5 product (assembly of CATParts and subassemblies)

*NX Assembly* *NX assembly (assembly of NX parts und subassemblies)*

CATDrawing CATIA V5 drawing (comprising one or more drawing sheets)

*NX Drawing* *NX drawing (comprising one or more drawing sheets)*

Vault A directory on the data server where the data is stored securely. Users do not have direct access to the vault.

ZSK Zeichnungsschriftkopf = drawing title block

# 4 Responsibilities

The implementation of and compliance with this work instruction are the responsibility of the vice president R&D; queries should be addressed to the R&D Engineering Services Team.

# 5 Description

## 5.1 Definition and objective of SmarTeam workflow

The purpose of using a workflow is to standardize the automation and control of work sequences in the company (e.g. release of CAD documents). The objective is to streamline and accelerate these sequences.

The workflow is divided into different (checking) stations. Each of the stations is equipped with individuals or groups of people with certain tasks to perform.

Once the workflow has started, different stations are stopped at for a document review depending on the workflow class. At each station specialist checks are performed on the documents/designs. Specialist checks may only be executed by employees who have been assigned this role (in SmarTeam). A check must not be performed by the person who made the design or started the workflow process. ***It is not allowed that a check is also carried out by the person who has start the workflow process.***

All documents generated with CATIA V5 */ NX* are released exclusively via the workflow integrated into SmarTeam. For this to work, all the relevant documents for a workflow must have been checked into or be present in SmarTeam.

To make changes to a document that has already been released (drawing, 3D model), a SmarTeam modification process must be initiated.

The following applies to all workflows: only once a document has passed through all the stations without any errors will the actual document release be executed and the document published.

## 5.2 Description of individual SmarTeam workflows

Within the GRAMMER Group, there are currently six different document workflows in SmarTeam:

- Release Process *(with or without C-Part Check / TechnologyCheck)*
- Modification Process*(with or without C-Part Check / TechnologyCheck)*
- Bagatelle Process
- Pre-Release Process
- V Number Process
- TIF Release Process

### 5.2.1 Release process and modification process

The release process is a multi-stage document workflow that can refer to new as well as, for example, revised documents. To feed a new (not yet released) document into the release process, a user (e.g. technical draughtsman/designer) must start the release process in SmarTeam. Initiating the process automatically triggers the individual release steps (stations).

The people involved in the release process are automatically notified by e-mail (Outlook) about completed stages of the workflow and/or about pending tasks when, for example, the designer requests release or one of the checkers releases or rejects the document. The entire document processing workflow is automatically logged for later reference.

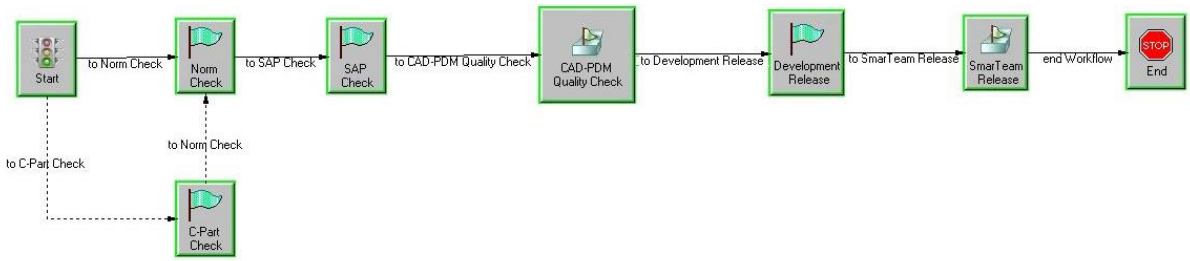



*Fig.: Structure & sequence of the release workflow with C-Part Check without Technology Check*

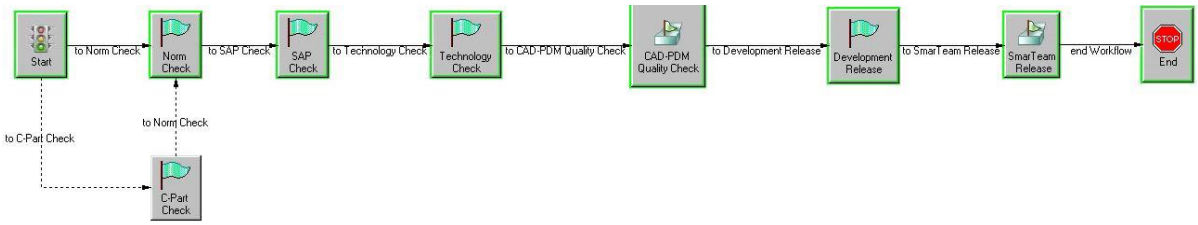



*Fig.: Structure & sequence of the release workflow with C-Part Check and Technology Check*

At the nodes (checking stations) Start Node, Norm Check, SAP Check and Development Release a SAP material comparison takes place. The inspection here involves examining whether the values to be passed on to SAP are correct.

*A workflow with C-Part Check is automatically indicated for standard parts and small parts (depending on the name).*

*If a workflow with C-Part Check and Technology Check is indicated, the part/the drawing is additionally checked by the welding engineer or the adhesive specialist.*

*This applies to Catia V5- as well as NX-data.*

Definition of the modification workflow: To make changes to a document that has already been released (drawing and/or 3D model), a user must initiate a SmarTeam modification process. The sequence of the modification workflow follows that of the release workflow (apart from the check by the welding engineer, which is not presented here). For this reason, the above information also applies here.

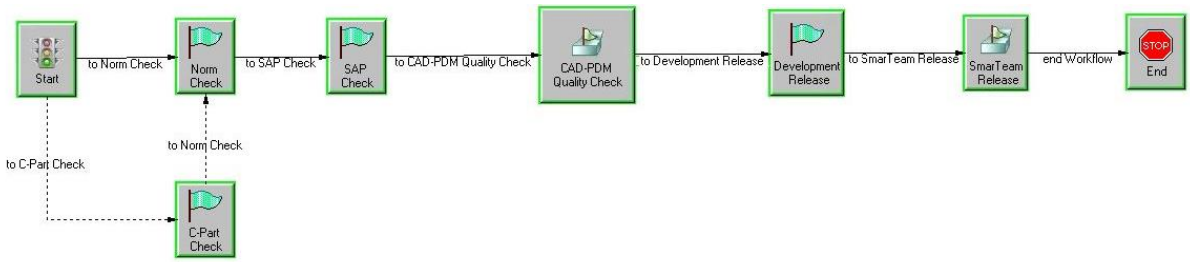



*Fig.: Structure & sequence of the release workflow with C-Part Check without Technology Check*

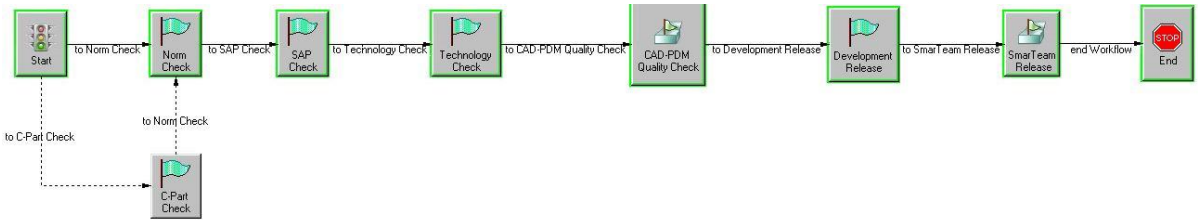



*Fig.: Structure & sequence of the release workflow with C-Part Check and Technology Check*

**Note:** Even though a check by the welding engineer is not included in this representation of the modification workflow, such a check is automatically requested by SmartFlow if the document to be checked relates to a welded product.

*When the title field of the part has a **.GS** included, than the SmartFlow automatically indicate a **check by the welding engineer**.*
*When the title field of the part has a **.GK** included, than the SmartFlow automatically indicate a **check by the adhesive specialist**.*

### 5.2.2 Bagatelle process

This simplified workflow is for amending/adapting documents that have already been released. Only "*minor changes*" to documents, such as a forgotten or an additional publication in the individual part of a CAD model, a spelling mistake in the drawing, or the like, which have no impact on the metadata (mapped to SAP) or the geometry, are transferred to this abbreviated modification process.
***A change of tolerances or geometric changes at the part/the drawing, the title and material are not allowed.***

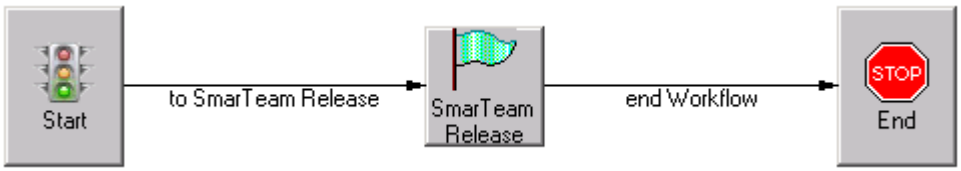



Fig.: Structure of the *"Bagatelle process"* workflow

### 5.2.3 Pre-Release process

The pre-release workflow makes it possible to document defined versions prior to the first official release for series production. The pre-release workflow must be used when a product is in a relatively early phase, though one already requiring initial offers, cost estimates and scheduling, etc. With this workflow, a separate numerical index (starting at 01) is assigned, which is also used in SmarTeam and in the drawing title block of the associated drawing derivations of parts/products. In addition, a *design freeze* is executed for the product, so the state of the objects is maintained for documentation purposes.

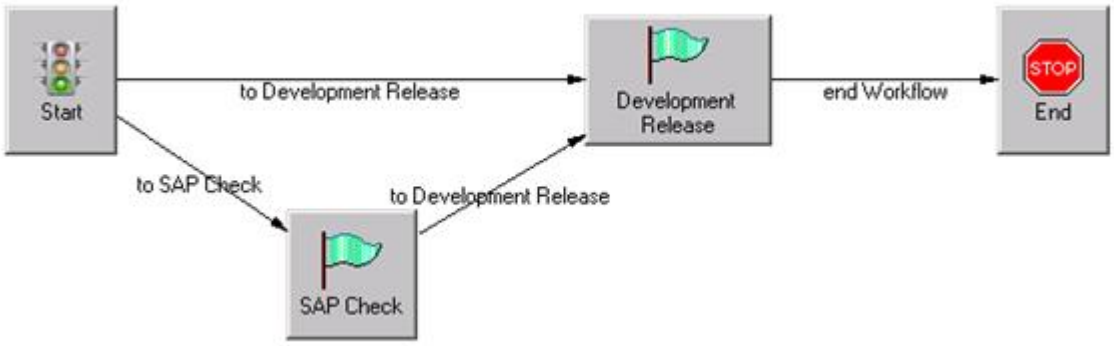



*Fig.: Structure of the pre-release workflow without Technology Check*

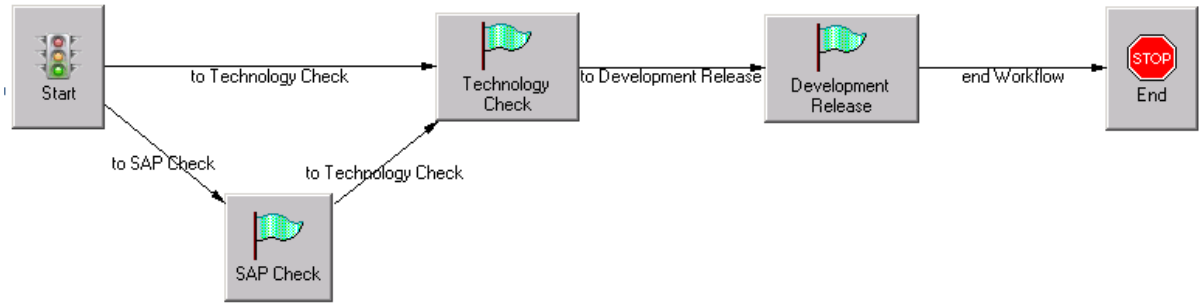



*Fig.: Structure of the pre-release workflow with Technology Check*

<u>The following sequences are controlled by the pre-release workflow:</u>

- Defined versions - identified by phase designation and numerical index - before the first release for series production.
- History/versions are furnished with an index in addition to the SmarTeam-internal revision.
- Versions are entered in the drawing title block and remain there until the first release for series production (entries in the change field of the drawing title block are removed with the first release workflow).
- Stamping of drawings with the note *PRE-RELEASE* at the end of the process if the workflow has been completed successfully.
- Products are frozen once the workflow has been completed successfully.
- Transfer and maintenance of SAP-relevant master data and documents (TIF, JT); labelling of documents in SAP with the status “VL” (Provisional).

The following points must also be observed with a pre-release workflow:

- A valid SAP number must be available.
- Detailed master data check, as with a “normal” release workflow.
- The text / description of the change must not exceed 50 characters because this is transferred to the drawing title block.

### 5.2.4 V Number process *(trial number)*

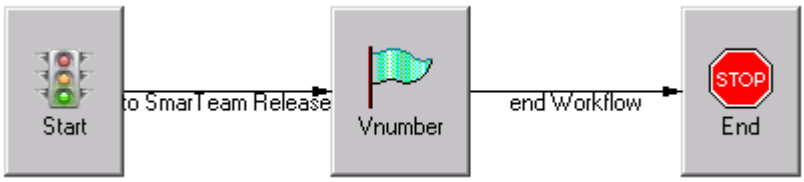



*Fig.: Structure of the V Number process*

This workflow does not include a document release in the true sense. It is a tool for documenting versions of 3D models and/or drawings already defined in the development environment (particularly advanced development).

There are no checks. No data is passed on to SAP.

## 5.3 Basic procedure for creating a workflow

To create a workflow, highlight the relevant document in the SmarTeam Editor, then right-click on it and choose the command “Initiate Process” from the shortcut menu. This opens a submenu in which the type of workflow (e.g. release process, pre-release process, etc.) should be selected.

If the data record satisfies the requirements for the creation of the workflow (e.g. checked-in status, change number entered, mandatory fields such as designation and material, etc. filled), a workflow is started automatically by the system and opened in a new window.

Documents with an identical part number are linked to the workflow automatically. If more documents are to be released with this workflow, they can be added to the process (highlighted in yellow in the screenshot below) using drag&drop.

Before the process can be forwarded, individuals or groups must first be assigned to the non-preset checking points. For release and modification processes, these are the “SAP Check”, *“Technology Check”* and “Development Release” checking points.

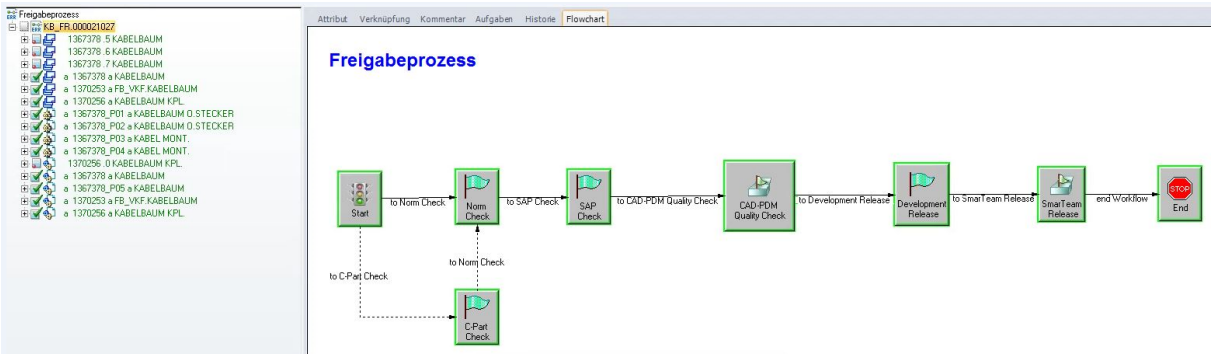
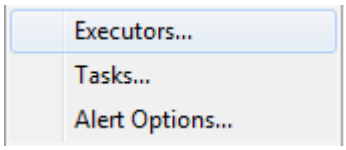
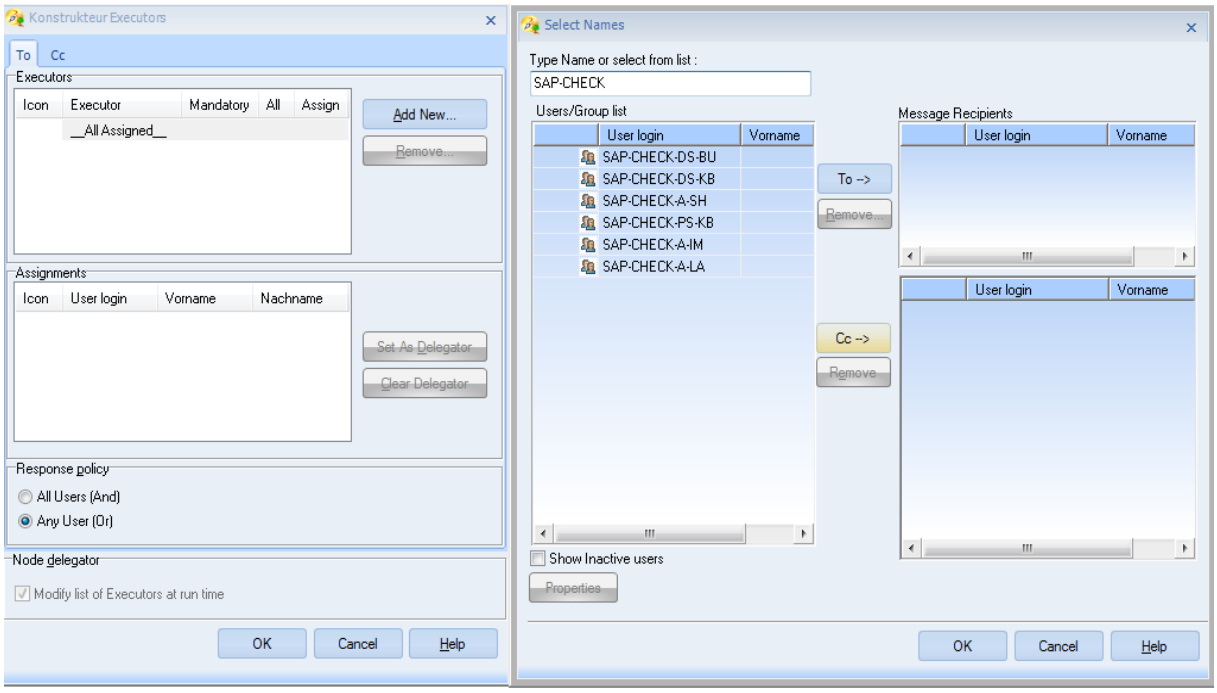



*Fig.: Structure & sequence of the release workflow with C-Part Check*

Right-click on the checking point and select “Executors” from the shortcut menu.



Then click on the command “Add New” to select the individuals or, as here for the SAP Check, the group.



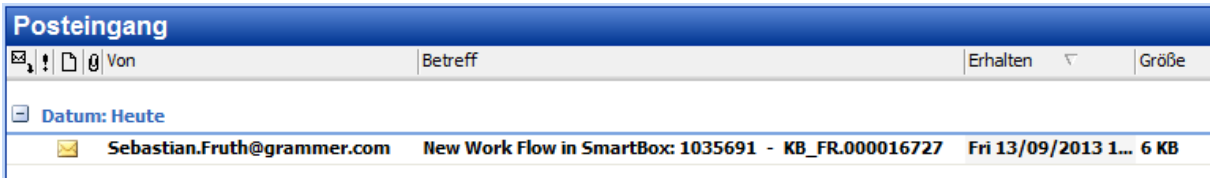

*HINT:*
It is best, at the Development Release checking node as well, to select not just one person, such as the responsible designer, but also a representative. This will mean that the workflow is not left unprocessed if a checker is absent.

*HINT:*
When it comes to compiling the content of workflows, the following should be borne in mind:
If numerous products, drawings, lower-level products or single parts are affected by a change, careful consideration should be given to which workflow “packages” are put together.
If, for example, a large number of documents are sent with a single workflow, the fact that the entire workflow will be “blocked” if the process is rejected at a checking point could be a disadvantage. It will not be possible to continue checking any of the documents linked to it.
One advantage of this approach, however, is that the workflow provides a complete overview of all the documents affected by the change. If the workflow has to be rejected because, for example, a single part needs to be reworked again, this will mean that the higher-level product must be versioned and the latest version of the single part incorporated. Given that this can only happen at the Start Node (initiator) of the workflow, the workflow of the product would have to be rejected anyway.
A sensible grouping of release processes must be weighed up on a case-by-case basis.

## 5.4 Basic procedure for editing a workflow

The procedure for editing (checking) a workflow is described below using the release process as an example.

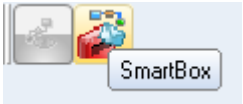
If a release process is ready for editing, the responsible checker is informed by e-mail in Outlook. The automatic notification includes the name of the release process, the part number with which the workflow was initiated and the name of the technical draughtsman or designer who initiated the workflow.




The SmartBox must then be launched so that the documents can be checked. The following applies:

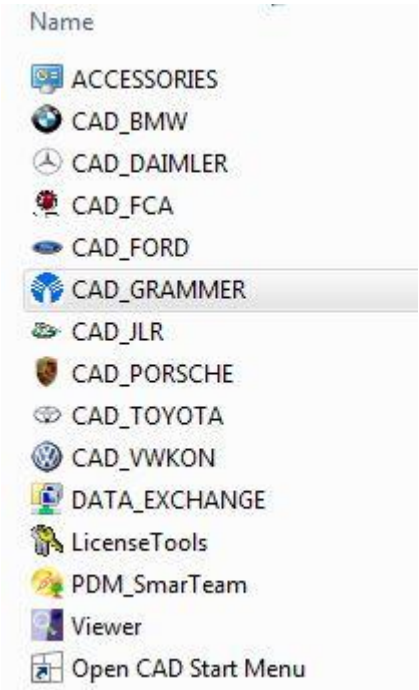
CATIA V5 */NX* / SmarTeam users who already have an active SmarTeam session can launch the SmartBox directly from the SmarTeam Editor.

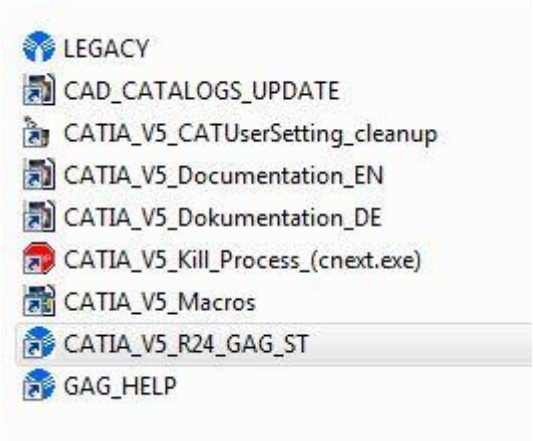
The icon for this is located in the “SmartFlow” toolbar.



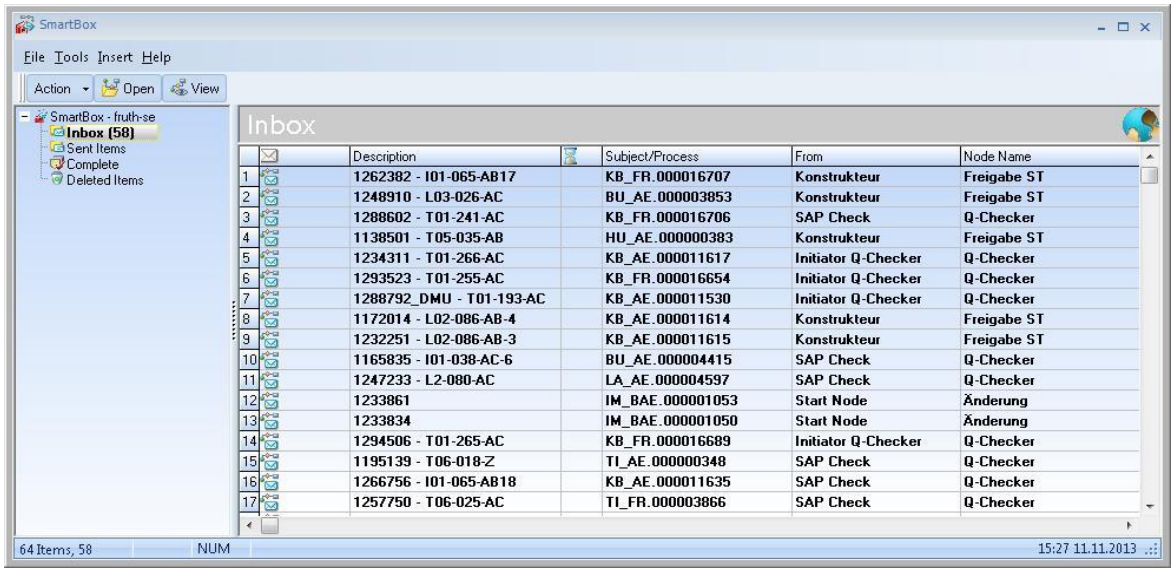

*HINT:*
*Update the SmartBox regularly with the F5 button.*

All other users activate the SmartBox from CAxStart *(Desktop)*:



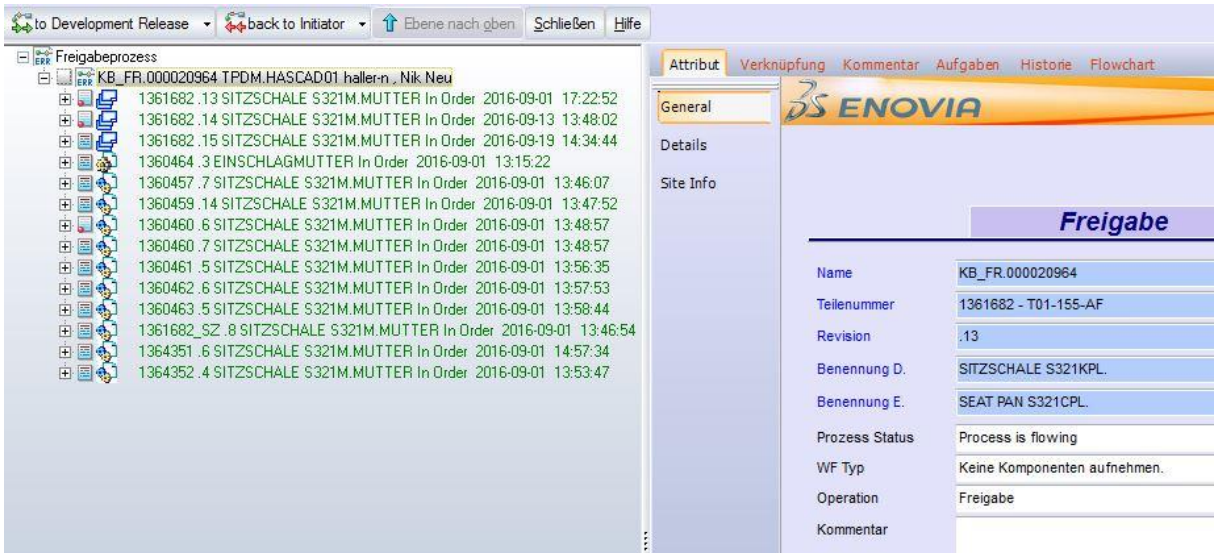



The workflows for editing by the respective user are located in the “Inbox” folder in the SmartBox.




To process an order, highlight the desired row with the left mouse button, then right-click and select “Accept” in the shortcut menu that appears. This marks the workflow clearly for other people at this checking point as "being edited" to prevent any duplication of the work.
The highlighted workflow can then be opened using the “Open” function button in the SmartBox toolbar.

A separate window opens displaying the actual workflow process.




Various information has been assigned to the release process. For example, the Profile Card in the right window pane provides, among other things, details of the previous sequence or history of the workflow.
To retrieve this information, highlight the release process and switch to the **History** tab in the Profile Card.

Here, for example, user ulbrich-a initiated the workflow at 14.35 on 28 April 2015 and sent it to the next check node (in this workflow norm check).
User heimler-v finished the workflow at 14.39 on 28 April 2015 and sent it to the next check node “SAP-Check”.
User pfleging-i finished the workflow at 15.25 on 28 April 2015 and sent it to the next check node “CAD-PDM Quality Check”.

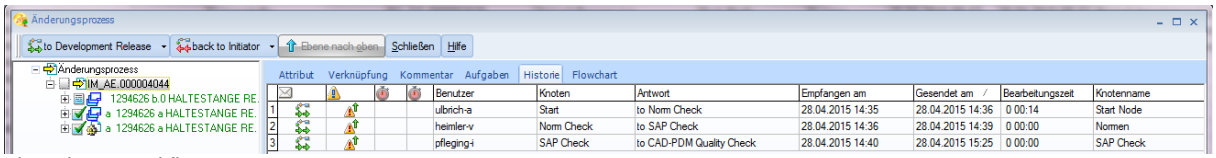


Fig.: History workflow

The entire sequence of the release process can also be traced graphically in a **Flowchart**:

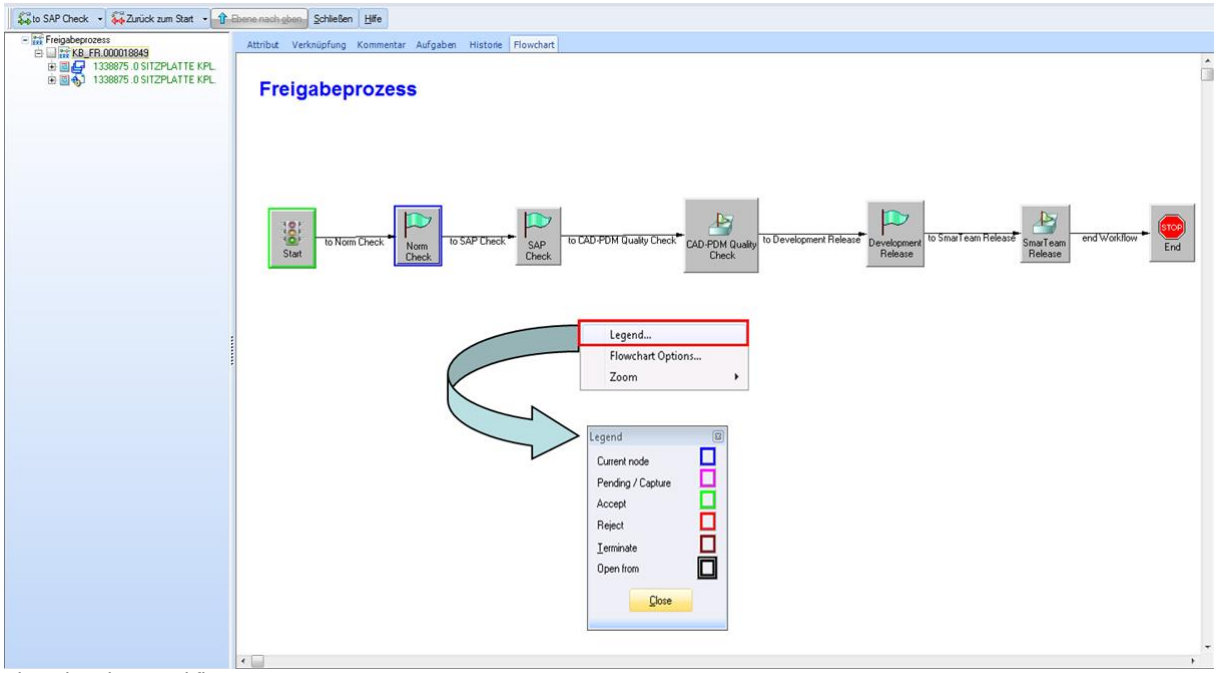


Fig.: Flowchart workflow

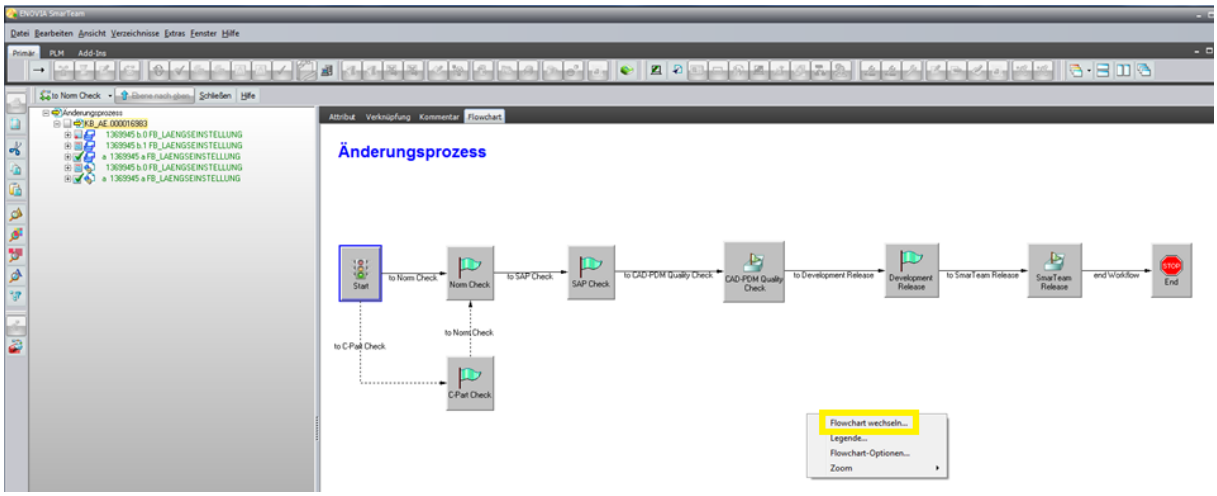
Right-click on the white background to access, among other things, a legend for the colors is shown.

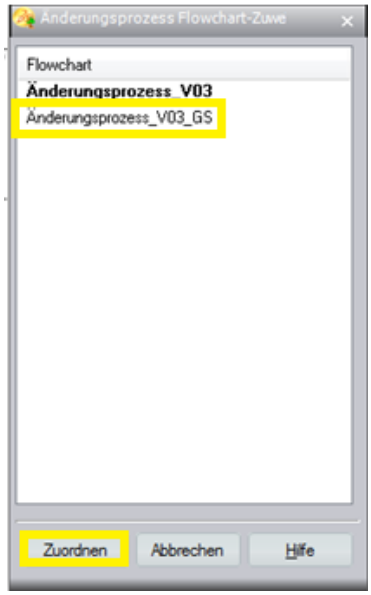
Each checking node of the flowchart can be viewed either by double-clicking or by using the RMB shortcut menu. This makes it possible to find out who is responsible for dealing with the operation. Some nodes are defined as *containers*. A container defines a *subflow*, which covers lower-level processes that may have an independent character or sequence (e.g. iterative cycle that can be dealt with within a container).

The structure tree view (left) shows all the documents linked to the workflow. They can now be checked.

*If additional a welding engineer or an adhesive specialist (Technology Check) should be registered, so do like this.*
*The additional registration is only possible on the Start of the workflow and when the workflow was not send already.*

*Right-click on the withe background > Switch Flowchart… > Prozess with **_GS** > assign*



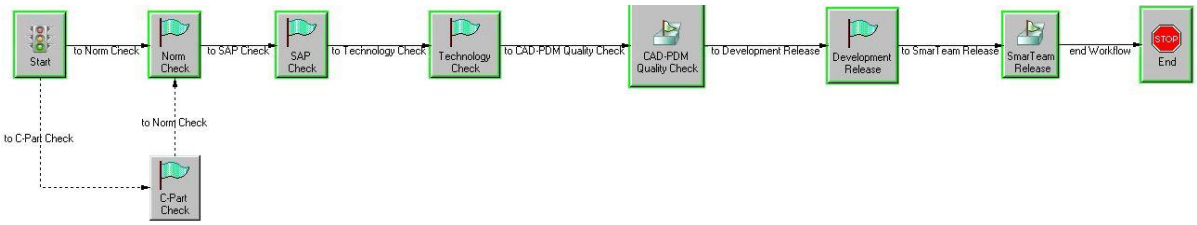




*Fig.: Workflow with C-Part Check and Technology Check*

### 5.4.1 Document control

If a drawing or 3D geometry is to be checked, highlight the corresponding document in the structure tree of the current release process using the LMB. The **Viewer** tab is then activated. It is now possible to navigate in the document viewer.

The structure tree icons for drawing, single part and product for Catia V5 are listed below:

Drawing (CATDrawing)

Single part (CATPart)

Product (CATProduct)

Standard part

*The structure tree icons for drawing, single part and product for NX are listed below:*

*Drawing (NX Drawing)*

*Single Part (NX Part)*

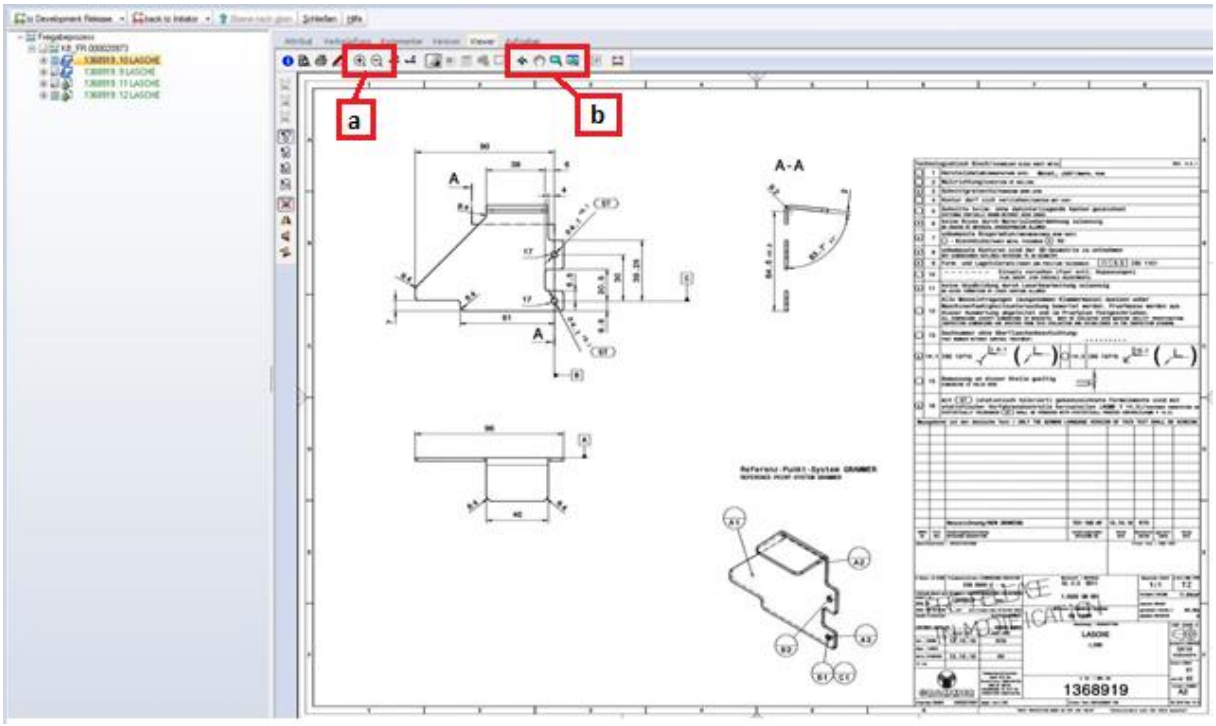
*Product (NX Assembly)*

*There is no symbol for standard parts.*

### 5.4.2 Drawing control

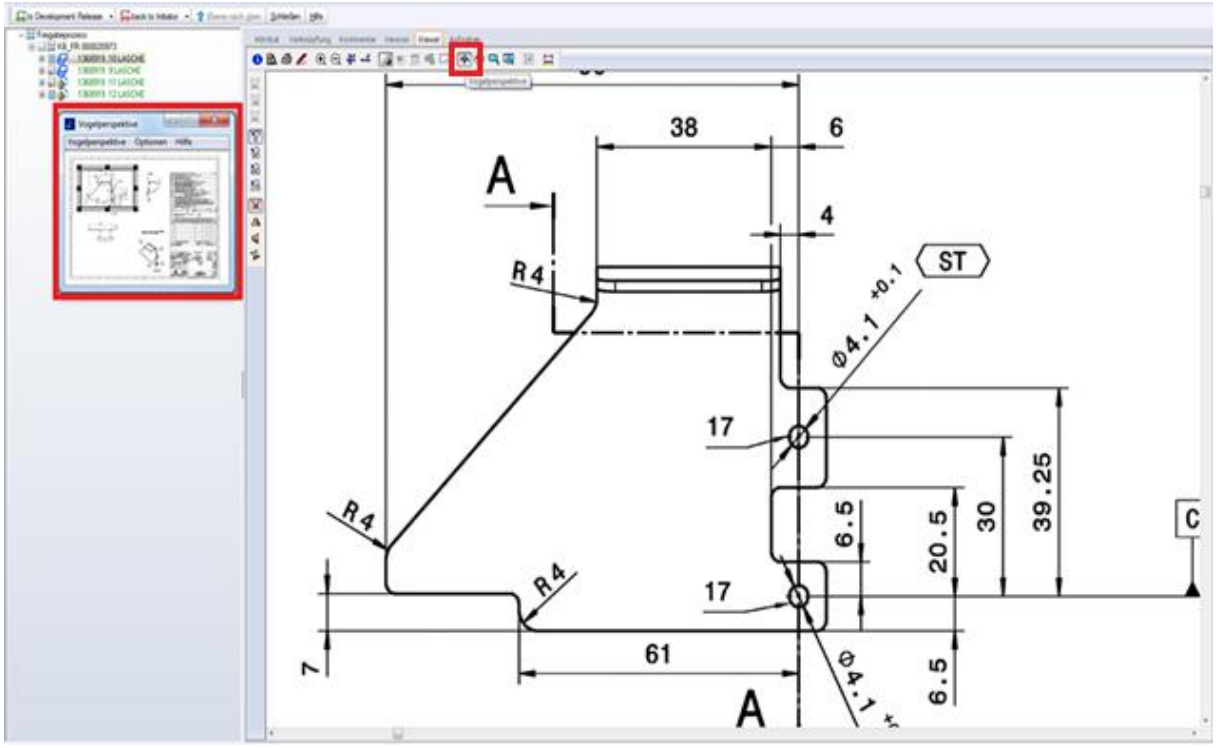
If a drawing from the document class has been opened, the following tools are available for navigating around the drawing representation:

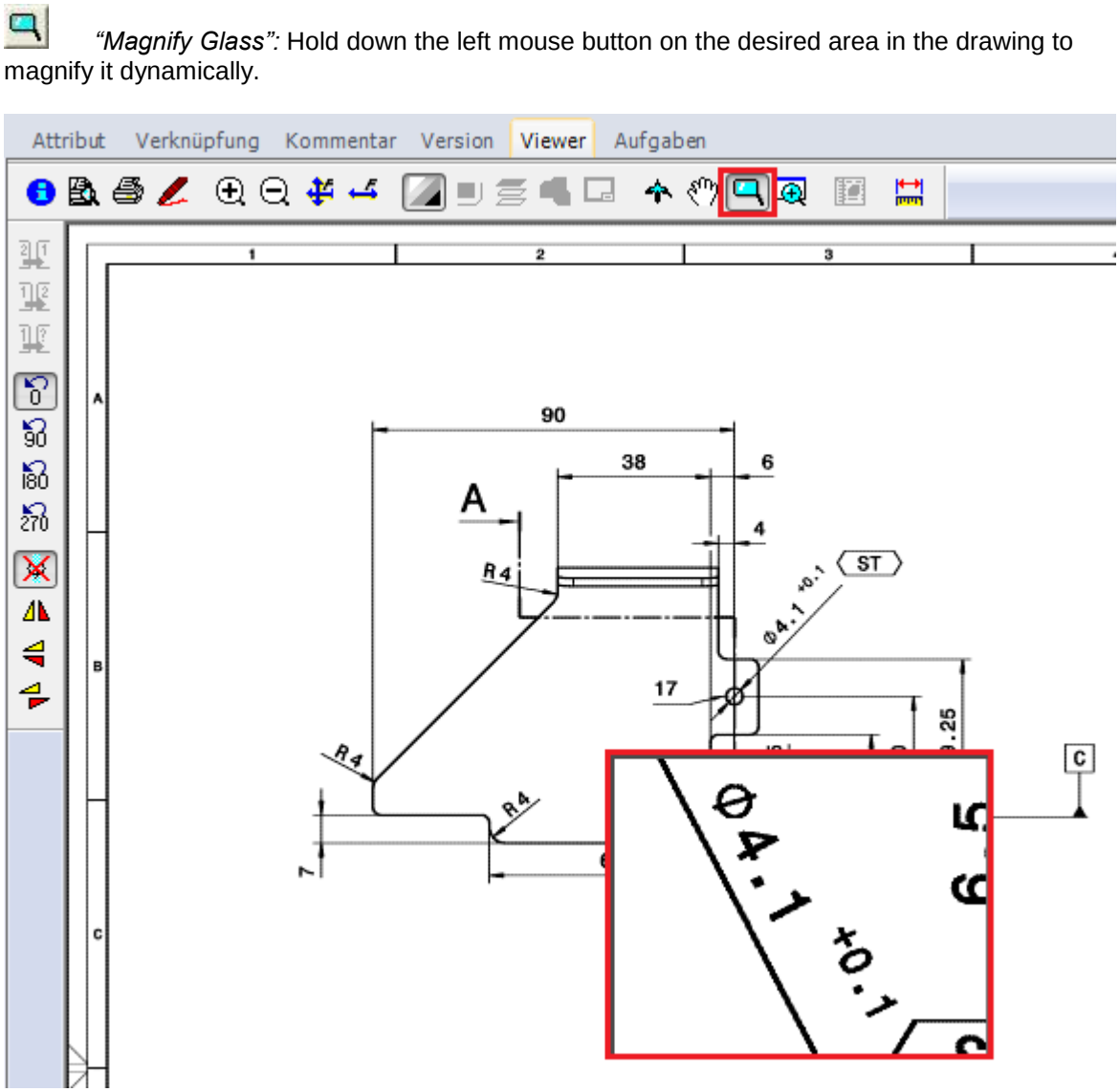
a) Zoom functions
b) Navigation functions



The available navigation functions are explained below:

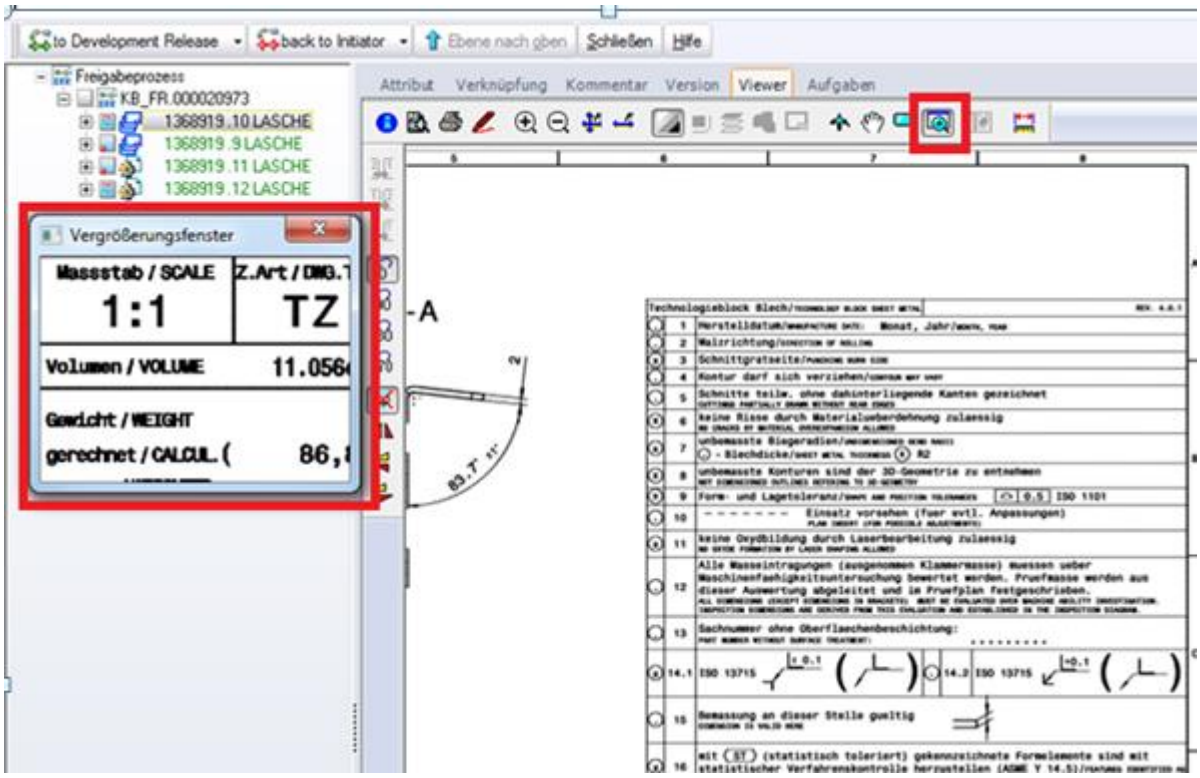
*"Pan and Zoom" / Bird´s Eye*: This opens an additional window (circled in red here for clarity), which always shows the general view of the drawing; the shaded frame is fully adjustable in size and position and marks the area that is displayed in the viewer.





*"Magnify Glass":* Hold down the left mouse button on the desired area in the drawing to magnify it dynamically.

*"Magnify Window"*: The mouse pointer changes into a magnifying glass; hold down the left mouse button on the desired area to magnify it in a separate window. As with the *"Magnify Glass"* function, the magnification is dynamic. Move the mouse while holding the LMB down to recalculate the magnification.



*"Pan"*: The area currently displayed is moved.

It is also possible to draw a rectangle around an area by holding the left mouse button down; the area contained is then displayed so it fills the window. Use the icon *"Zoom to fit"* to fit the drawing inside the window again.

With all zoom and pan functions, clicking on the icon for a second time deactivates the function again.

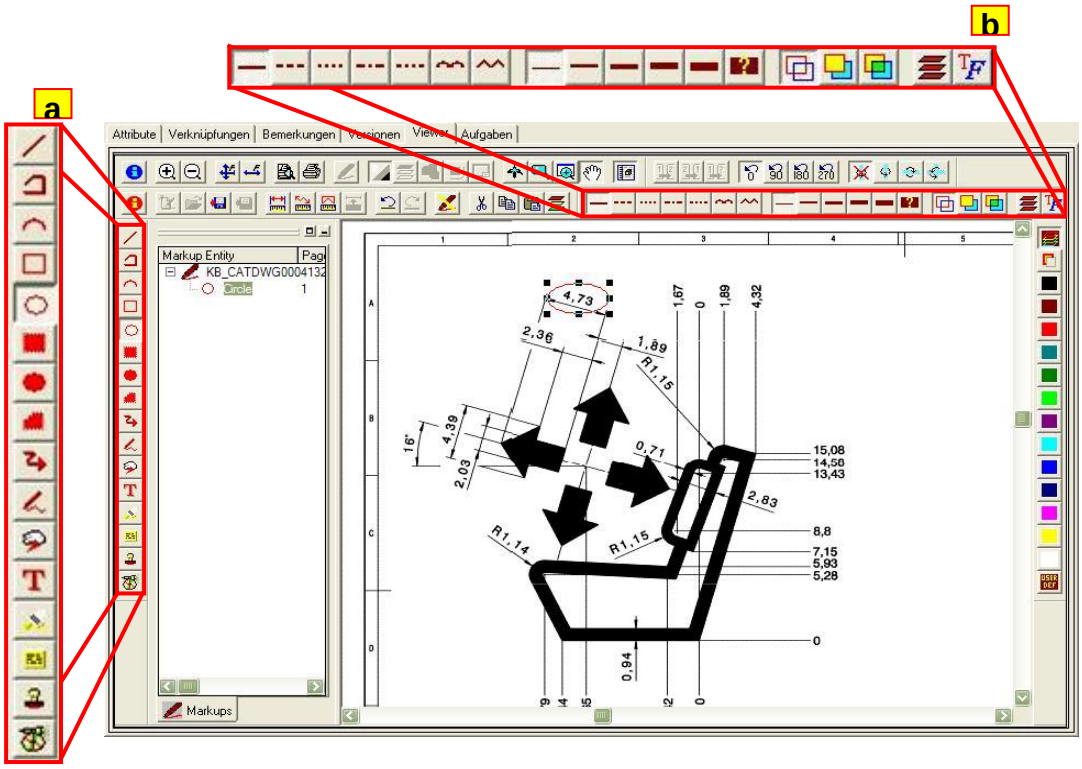
### 5.4.3 Redlining

If errors are noticed when checking the drawing, these can be highlighted immediately in the viewer. To do this, the user selects the *"redlining"* icon, which starts the corresponding function.

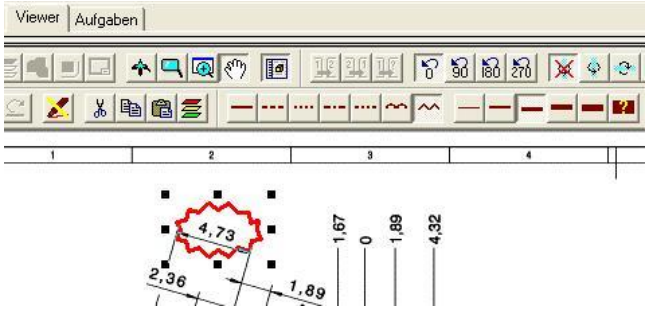
Launching the *"redlining"* function puts the user into edit mode for the document displayed, where there are several tools for entering proposed amendments.

All the tools are in the left pane of the viewer, while the top and right edges of the viewer contain functions that change the properties of the texts, lines and circles, such as line style, line width and colour, etc.

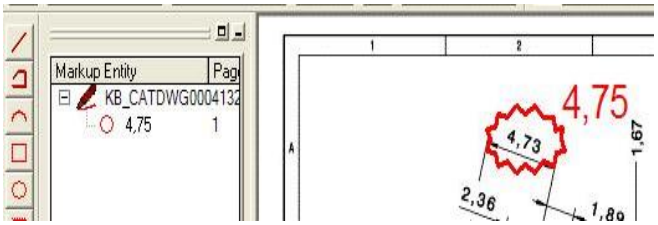
a) Redlining toolbar (writing annotations, sketches & notes)
b) Options bar = options for controlling the redlining tools



Already generated annotations can also be edited subsequently by selecting the desired object either in the layer structure tree or in the viewing pane (here the circle around the measurement 4.73) and configuring the desired line style, line thickness and color, etc.:




Use the function to add another annotation to the object. A text of any length can be entered in the input window of the function.




The text is then correctly positioned next to the symbol.

**Important note:** The workflow should not be forwarded or rejected until redlining mode has been exited (click on the symbol in the SmarTeam viewer).

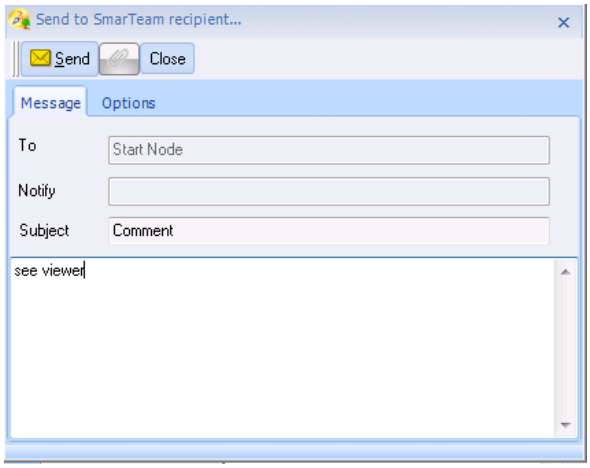
### 5.4.4 Rejecting document

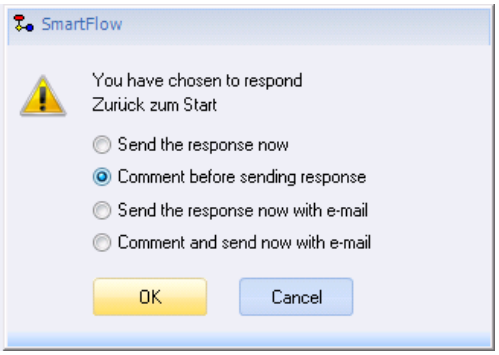
If documents are to be rejected, the command *"back to Intiatior"* must be selected. Rejected workflow processes always automatically end up with the person who initiated the release process. It makes no difference which object is currently activated or whether *redlining* mode has already been exited.

*On initiator node no released documents can be checked out, this is only on start node possible. If a released document should be changed, the workflow must be rejected "Return to Start" this may be carried out by the checker, but also by the initiator itself.*

If a workflow (a release) is rejected, a dialogue window opens. Here, the rejecting station must choose how the process will be returned to the initiator. Only the first two options should be selected here.

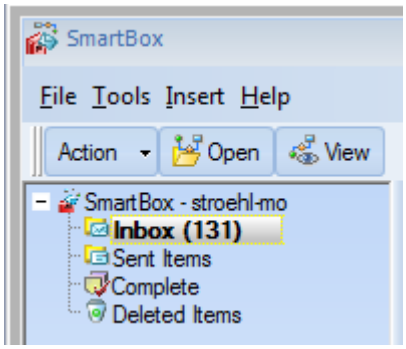
If the option *"Comment before sending response"* is chosen, a Message window will appear in which information can be entered (here, for example, "see viewer").




As a result, the workflow process will disappear from the inbox of the checker/designer and land in the inbox of the technical draughtsman (= initiator of the workflow process).

At the same time, it will also appear in the designer's “Sent Items” folder from where it can be reopened at any time and looked at with the command *“View”*.




Once the technical draughtsman has made the changes and again sent the workflow to the designer, it ends up back in the latter's inbox. An automatically generated e-mail tells the checker to look in his SmartBox inbox.

**Important:** When checking, make sure to view the latest version of the documents.

**Obsolete versions**, which may be created during the course of a workflow, are marked with a red dot.

### 5.4.5 Forwarding document for release

If there are no (more) objectionable errors in the documents, they can be directed to the next stations in the release process using the *„to Development Release“* function.

The documents then pass through the checking points Norm Check, SAP Check, CAD-PDM Quality Check, where, among other things, checks are carried out to make sure that the structure of the CAD model and drawing is correct and conforms to GRAMMER requirements, that the representation of the drawings is standard-compliant, and that filing and project linking in the SmarTeam database are correct.

The workflow is again deleted from the designer's inbox, but it can be viewed and tracked at any time in the “Sent Items” folder. Once the release process has been completed, the workflow will be moved from the “Sent Items” folder to the “Complete” folder.

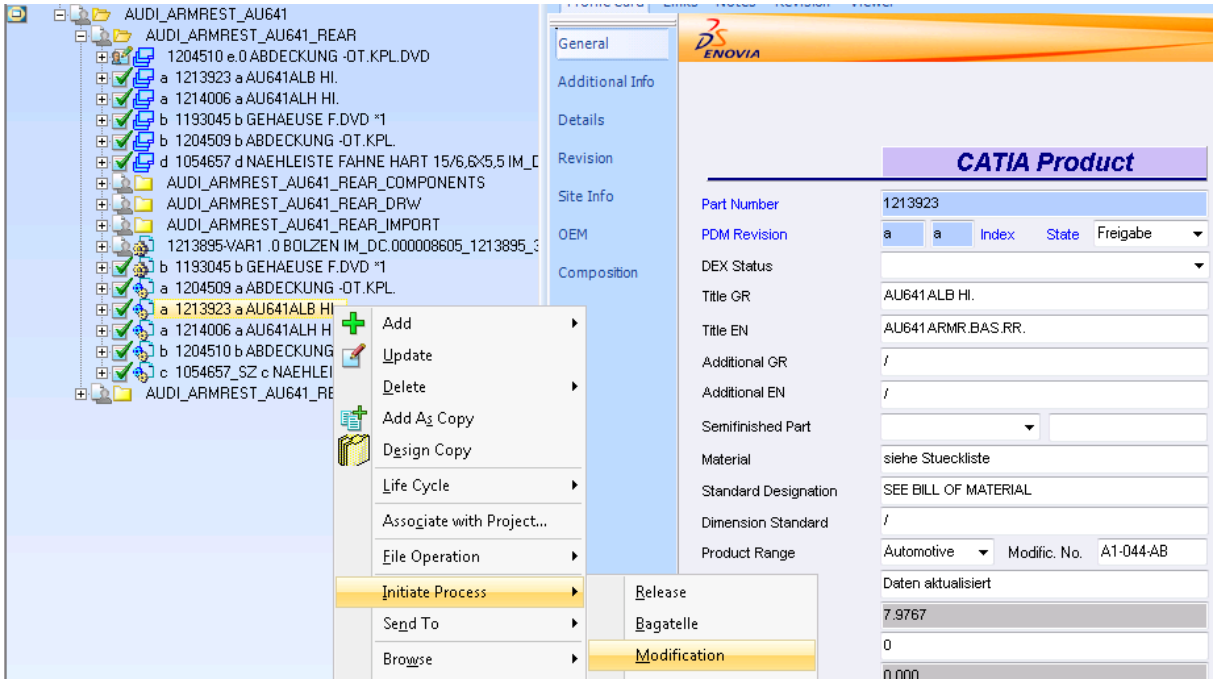
## 5.5 “Special case” modification workflow

With regard to use of the modification workflow, there are a few special features that must be borne in mind to do with execution and sequence.

- The modification workflow is only used for documents that have already been released.
- A modification workflow can be initiated by any SmarTeam user.
- If a modification workflow has been started, no automated message about this change is transmitted to SAP. This situation persists until the workflow is sent to the *Standardisation* station. When the workflow is sent to checking, the status of all the documents linked to the workflow is changed from “released” to “being changed” in the SAP DMS.

If a modification workflow needs to be executed, this can be done in the following way:

1. Open the document view of the SmarTeam Editor
2. Initiate modification workflow: RMB shortcut menu on the already released document -> Initiate Process -> Modification




3. Once the process has been initiated:
4. Open the process via the SmartBox
5. Generate a new version either by using the *lifecycle* function or by right-clicking on the corresponding document and selecting *File operation -> Open for -> Open for editing*
6. Incorporate the change(s) -> Save document -> Check in document
7. Forward the process to the next station via the SmartBox.

If all the workflow stations are passed through successfully, the new release of the document is activated as the last station (before the end node) within the workflow.

# 6 Applicable documents

| | |
|---|---|
| Sammlung CAD-/PDM-Dokumente / Collection CAD/PDM Documents | A_015_012 |
| | |
| | |

# 7 Changes

10/2013
Replacement for “GL-14-04.2008-FE”
New template / revision

06/2015
Item 5.2.1
Item 5.3
Item 5.4
Item 5.4.5

10/2016
Transfer to new template / revision