Work Instruction

015 Research + Development

CAD Data Generation and Exchange

W_015_018

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1 Purpose

This work instruction defines the basic principles of data creation and checking at GRAMMER AG. It also regulates structured CAD data exchange with external partners that create and/or edit data in the name and on behalf of GRAMMER AG or receive access to such data.

The work instruction additionally describes the associated documentation and/or documentation obligation in relation to the data exchange process.

2 Scope

This work instruction shall be binding for all GRAMMER AG companies worldwide as well as for external partners that are part of GRAMMER AG's design/development process and create data for GRAMMER AG in this context or exchange such data with GRAMMER AG.

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.

Upon entering into force, this work instruction shall replace all previously valid directives and work instructions 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

CAD	**C**omputer-**A**ided **D**esign
CATIA	CAD system for generation of 3-dimensional design data and drawings, for example
SmarTeam	System used to manage CAD data at GRAMMER AG
GlobalX	Tool for dataexchange
ASTRAS	*Tendering portal*

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.

External partners must be informed of this work instruction by the *purchasing department.*
The current version is stored in the GBS under 054 Product Data Management.

5 Description

5.1 Generation of CAD data – General information

General definitions for generating CAD data for GRAMMER AG are described below. The two development areas within the Group, Automotive and SeatingSystems, both work with CATIA V5 and/or NX, depending on customer requirements, though their data generation and exchange requirements differ to some extent. To provide a clear distinction between the respective requirements, this document has been divided where necessary. Passages that apply to both areas of R&D are not marked.

SeatingSystems	Automotive
If CAD data is created and/or edited at external partners and engineering service providers (outside GRAMMER AG), the purchasing department is obliged to include compliance with this work instruction in the respective supplier agreements and contracts.	

5.1.1 CATIA V5 release, infrastructure and presets/settings

CATIA V5 is the standard system used at GRAMMER AG in the design of parts (CATPart), products (CATProduct) and drawings (CATDrawing).

External work must be carried out with the version of CATIA currently in use at GRAMMER AG.

Basic data generation settings:

SeatingSystems	Automotive
The CATIA V5-relevant settings in Tools - Options (so-called GRAMMER settings) are defined in a supplier pack. This pack is supplied to the external partner by the dept. C-RD7-DE9. Within GRAMMER AG, the starting models as well as Tools - Options (so-called GRAMMER settings) are maintained and updated by the department C-RD7-DE9 - Engineering Services.	The relevant settings are prescribed by the customer/OEM environments in Automotive. Every OEM publishes these environments, in which the basic settings are defined, on its B2B web portal. The latest ones can be downloaded from there. If you are unable to gain access yourself to the relevant customer portal, you must inform the Automotive CAx Administration.

At the start of the project or in case of doubt, ask the project manager and C-RD7-DE9 which release should be used for the design. Unless it is in the delivery or has been defined in a specification sheet.

SeatingSystems	Automotive
Data for GRAMMER AG is to be defined in the GRAMMER environment.	Automotive data is to be created in the respective OEM environment.

If, on the basis of customer requirements (e.g. OEM of the automotive industry), different release and service pack versions of CATIA V5 must be used, the customer requirement must be met. The customer takes priority over the definitions specific to GRAMMER AG (environment & starting models).

Language environment in which CATIA V5 can be executed:

SeatingSystems	**Automotive**
CATIA V5 can be executed in both German and English language environments.	

Document management:

SeatingSystems	**Automotive**
Where new parts, products and drawings are to be created by the supplier, only “empty” CATIA V5 models generated by GRAMMER AG must be used. These are supplied by C-RD7-DE9 - Engineering Services, on request. !!!These must not be reproduced!!!	
For parts and products, no entries should be made in CATIA in the product tab in the properties window under the part number, except if data is stored filebased.	
As a general rule, the data management functions of CATIA SmarTeam Integration must be used within GRAMMER AG. To create new CATIA V5 documents, only the script-based function “New Documents” in CATIA V5 is used. This function guarantees that an SAP-compliant part number is generated and registered.	

5.1.2 Data creation by external partners

If data is created for GRAMMER AG outside the company by external partners, the following applies:

External developers must be urged to provide all CAD data in native CATIA V5 format (= original is CATIA-generated). Exceptions are permissible if a GRAMMER AG customer or GRAMMER AG itself requires a different data format (e.g. UG or Pro/E).

The following applies to suppliers of CAD data: The intelligence (parametrics…) of the models must be supplied as well unless there are written agreements in place relating to specific confidentiality or supplier know-how, etc. that preclude this.

GRAMMER receives the constructed parts with product structure and complete formation of the component tree.

Before the start of the project a 1 day on both sides cost-neutral training in dealing with the Grammer requirements must be completed. This applies to all the designers construct in the project. "

Starting models for data & drawing generation:

SeatingSystems	**Automotive**
Designs may only be generated in these prepared models. CATIA V5 documents may only be managed in the CATIA environment using the commands Save, Save Management, Send To and Save As. Commands that are executed with Explorer/File Manager, for example, and which could destroy the link structure of the data must not be used.	
Empty drawings are provided in A3 to A0 format. The line groups used must correspond to the formats.	The format depends on the drawing.
The title block and format of a drawing can only be completed or amended using GRAMMER AG's PDM system.	
It is prohibited to activate the function New From or, when saving documents, the option Save as New Document. This would change the UUID of the data record, which is not allowed.	

Objects and drawings must be created according to GRAMMER AG directives and methods. If the data (3D models, products & drawings) is produced for a customer on the customer's behalf, any customer directive and method that exist must be taken into account in the definition.

SeatingSystems	**Automotive**
Generally speaking, in the final version saved, all relevant parts must be in Show (visible area) and the design must be entirely visible.	

5.1.3 File and object names

For filenames:

Characters allowed:
- Letters A - Z and a - z
- Numbers 0 - 9

Special characters allowed:
- Underscore _

For **object names** in the structure tree of CATIA V5 documents (e.g. features, bodies, geometrical sets, parameters, relations, etc.), the following stipulation applies:

Characters allowed:
- Letters A - Z and a - z
- Numbers 0 - 9

Special characters allowed:
- Minus sign -
- Underscore _
- Greater than >
- Less than <
- Opening round bracket (
- Closing round bracket)
- Space

Objects already named must not be renamed / changed. This applies in particular to the *Teilenummer* (*part number*) entry in the properties of the part / product.

5.2 Data checking & identification

The procedures and restrictions defined in this section apply both internally within GRAMMER AG and externally at data suppliers.

SeatingSystems	**Automotive**
	The checking modules are prescribed by the respective customer/OEM.
A successful data check using Q-Checker is important for ensuring correct data consistency. Data checking with this tool is an ongoing process that accompanies the creation of the data and of the virtual product from the very outset.	
	The checking scripts are prescribed by the respective customer/OEM.
The checking scripts that are relevant to or needed for checking with Q-Checker are available from the C-RD7-DE9 - Engineering Services department and must be kept up-to-date.	

In terms of the data check and the corresponding checking software, further requirements are defined in the following points of this section.

Examination of the data with the Q-Checker must contain no test result "KO". Data from external partners who do not meet this criterion will not be accepted by the GRAMMER AG or accepted.

A documentary about to use the Q-Checker can be found on the intranet of GRAMMER AG. External partners, this document must be provided upon request or can be downloaded from the websites of Transcat PLM GmbH & Co. KG under http://www.transcat-plm.com down.

The CATDUA exam is to be applied regularly.

5.3 Data exchange – General information

In principle, all data must be exchanged using GlobalX *or ASTRAS* if it cannot be exchanged via the *customer* portal.
In ASTRAS only files may be stored in the JT format.

CAD data may only be sent by the designer directly. No intermediate storage on drives!

Data for supplier inquiries must be exchanged in JT format. The ISO-certified JT format offers greater protection of know-how, is significantly smaller (data volume) than the original format and is independent of the respective CAD release. Free JT viewers are available on the Internet; these contain functions for measuring and cutting geometries.

For tool ordering purposes, the CATIA or NX native data must be sent.

5.3.1 Exchanging CAx data

For documentation reasons (liability, warranty, etc.), any CAx data transfer from and to customers, development partners, suppliers, tool makers and so on must be recorded or documented. At GRAMMER AG, there are various ways and methods for exchanging digital media and data. Not all standard data transfers, such as the exchange of documents by e-mail, satisfy the demand for complete documentation. Consequently, when exchanging “sensitive data”, GlobalX must be used.

SeatingSystems	**Automotive**
Other documents (non-CAD data) and documentation (e.g. measurement data, logs, inspection reports, etc.) can be exchanged in PDF (without password protection) and/or TIFF G4 format. Such data may be exchanged by e-mail up to a file size of 2 MB. There is also the option to transmit this data via GlobalX. *The data will encrypted bevor sending the data with Globalx.*	
As in GlobalX carried out the central documentation of our data exchange, other exchange channels as USB devices, DVDs, CDs, e-mail or ALFRESCO are not allowed. These requirements apply to all development data subject to secrecy!	

5.3.2 Organising the exchange of data via GlobalX

Only one contact is created as a user for each external data exchange partner (suppliers, external service providers, etc.).
Only from our purchasing released suppliers get axccess to GlobalX!

The documentation for *GlobalX* can be found on the Intranet at:
http://intranet.grammer.com/de/bereiche/f-e/produktentwicklung/datenaustausch/

Dataexchange with WEB:
Only one user of a company can get axcess to GlobalX WEB

Dataexchange with OFTP:
For OFTP multiple users can be created in GlobalX

5.3.3 Executing & documenting the CAx data dispatch to customers & partners

SeatingSystems	**Automotive**
The GRAMMER AG Intranet contains a form to be completed if the data cannot be sent personally (e.g. DMU,…). http://dfue.cad.has.grammer.de/seiten/auftrag.html	Every designer is himself responsible for organising his own data exchange.
These entries are then written automatically to a database that can be viewed using the following link: http://dfue.cad.has.grammer.de/ The same applies to the sending of drawings in TIFF or PDF format. Please make sure that all drawings are furnished with the border stamp as stamped by the drawing archive or ConvertWIZ.	Documenting the data exchange is the responsibility of everyone (every designer) who sends data. The data delivery notes (screenshots, etc.) must be stored in the respective project directories.
Data that is sent/received by GlobalX is documented automatically there. The corresponding data records *can* be stored in the directories X:\DATA_EXCHANGE\GlobalX. The X:\DATA_EXCHANGE\GlobalX directory is saved onto a NAS system every weekend and is therefore available as a long-term archive (in the event of data losses or discrepancies).	

Also note the following:

When exchanging data with our customers, there are often strict rules that must be observed, otherwise the automatic functions set up there will not work:

SeatingSystems examples:

John Deere	only accepts ProEngineer data records (3D) or HPGL files (2D) via OFTP2
MAN	accepts 3D in STEP and 2D TIFF data via OFTP2
Siemens Verkehrstechnik	only accepts ProEngineer data via the Siemens portal

Automotive examples:

Daimler	accepts V5-/ NX-/ PLMXML-JT data and TIFF for 2D, depending on the project, via OFTP2. The data must be checked using Daimler's Q-Checker. According to the agreement with the person in charge of the components.
VW AUDI	accepts CATIA V5 data via KVS (design data management system)/clipboard. The data must be checked using Validat.
BMW	accepts CATIA V5 data. Exchange via *OFTP2* to the BMW portal. The data must be checked using BMW's Q-Checker.

The list has no guarantee of completeness!

Differing arrangements between designers at the customer and GRAMMER employees often lead to huge additional effort and loss of data quality.

In addition, any replacement of the CAD system should be avoided. With many of our customers, suppliers and development partners, we have optimised data exchange parameters that achieve far better data quality than a quicker data exchange via IGES, VDA or DXF.

5.3.4 Sending data to GRAMMER AG

SeatingSystems	Automotive
The sending of data must be documented according to the project and partner. This requires consultation with the project manager.	
Data that has been changed but not obviously so must be marked/identified. Coloured marking within the CATIA data record (highlighting of geometric elements), for example, or the generation of Notes (texts with reference, etc.) is possible upon consultation with the project manager.	

Data that does not comply with these instructions is not accepted by GRAMMER AG.

Data to be sent can be uploaded directly to the GlobalX environment.

5.3.4.1 Supplier drawings

Definition of supplier drawing: Supplier drawings are to be understood as drawings that carry an external company identification in the basic title block; they cannot therefore be designated GRAMMER AG property.

SeatingSystems	Automotive
Part and product drawings created by the supplier must be provided as TIFF G4 data. Incoming data must be zipped!	This requires consultation with the project manager.

6 Applicable documents

Sammlung CAD-/PDM-Dokumente / Collection CAD/PDM Documents	A_015_012
Handbuch der Dokumentenverwaltung	Intranet

7 Changes

01/2013
Replacement for Work Instruction “AA-06-04.2008-FE”
New draft

04/2015
Item 5.1
Item 5.1.1
Item 5.3
Item 5.3.2
Item 5.3.3
Item 5.3.4

01/2016
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