

# GENIUS TOOLS MBD for ISO GPS

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## Description of all functions

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# I. GENIUS TOOLS MBD for ISO GPS

This product supports you in the creation of structured, semantic MBD models in accordance with company-specific standards. MBD models can be both parts and assemblies. The time-consuming manual creation of combined views and the associated properties (e. g. appearances) can be done with just a few mouse clicks and templates. Customizable color schemes and coloring functions allow you to quickly color any display.

Models structured in this way are a suitable basis for generating technical data packages (TDP). Using rules and templates, TDP generation is based on the structure of a book with different chapters. The result is a TDP PDF in which further data (e. g. PVZ, STEP) can be embedded. The TDP can be generated automatically using other tools, e. g. via the Windchill Worker process.

Other modules help you keep track of annotations and assist you in various situations when creating MBD models. These modules are listed and described in this document:

- Managing functions with *Function Manager* and its Editor
- Creating tables in 3D with *MBD Tables*
- Generating Technical Data Packages with *Export TDP*
- Multi-dimensional editing with *Dimension*
- Creating and inserting inspection and change symbols for parts and assemblies with *Inspect 3D*
- *Name Generator* assigns names with sequential numbering for file names, e. g. of parts
- Ring menu and mapkey management with *Quick Access*
- Referencing surfaces to the general tolerance with *GenTOL References*
- Getting information about annotations with *Annotation Info*
- Transferring annotations with *Annotation Transfer*
- In-depth annotation text editing and template creation with *GTOL Text* and its Editor
- Displaying combined views in an overview with *Combined View Gallery*
- *Find Contact Surfaces* and *Select Contact Surfaces*
- Subsequent sorting of combined views with *Sort Combined Views*
- Setting TEDs with *Set TED Dimensions*

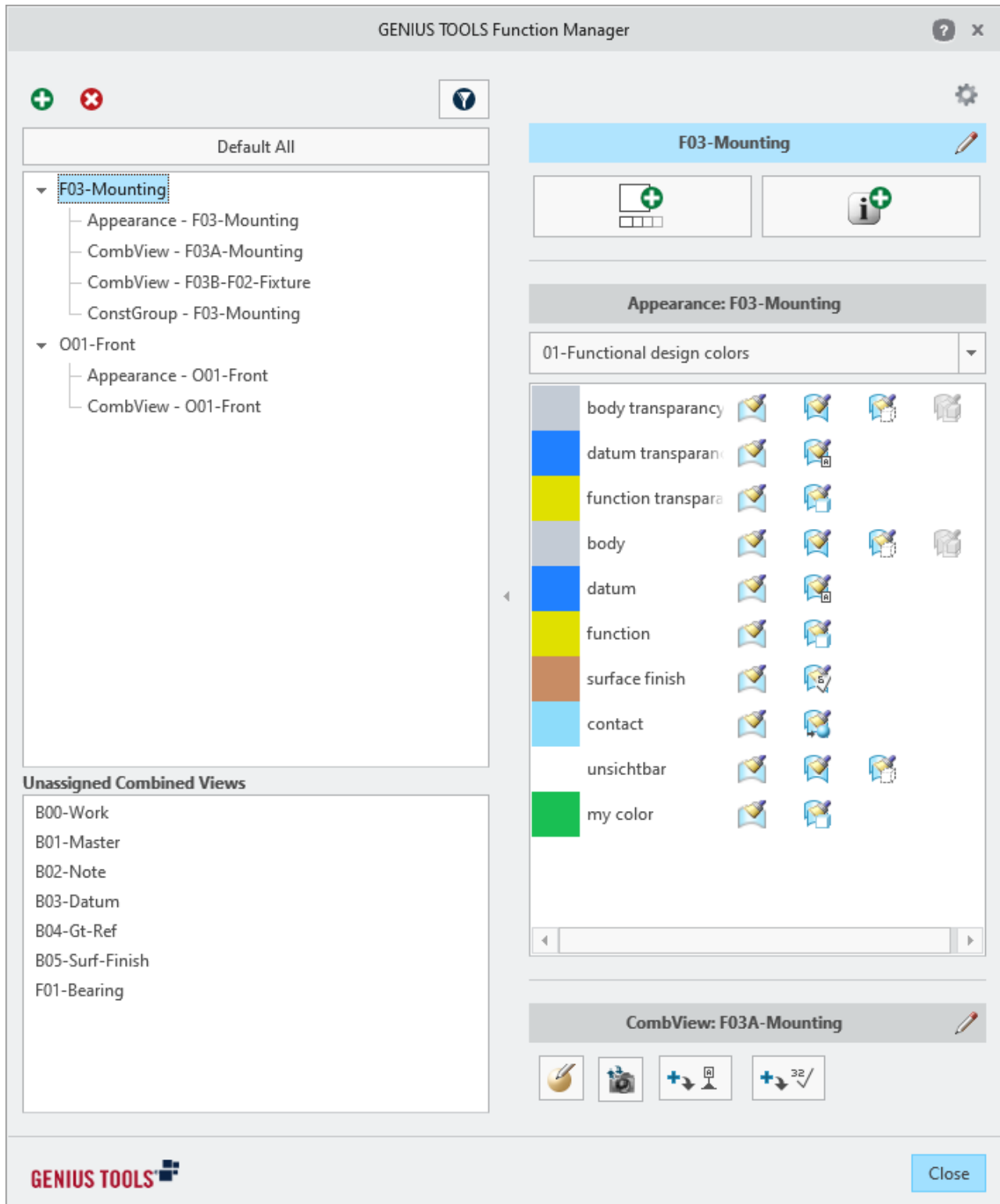
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**Please note:** GENIUS TOOLS MBD for ISO GPS can be used with Creo Parametric Version 10 or higher.

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# 1. Managing functions (“Function Manager”)

The module *Function Manager* allows you to create and manage functions and associated functional components that you need for functional construction and specification in 3D. Templates for functions and functional components can be read as XML files.



*Function Manager* is available in part mode and in assembly mode with the following features:

- Overview of existing functions and their functional components (combined views, appearances, etc.)
- Real-time editing of functions and functional components: adding, renaming, extending, deleting
- Generating several combined views at the same time and displaying them in the model tree
  - Generating combined views alphabetically without scrolling in the Creo Parametric main window
- Switching between combined views without switching views
- Editing, grouping and deleting combined views
- Automatic naming of functions
- Coloring of surfaces, features and parts
  - A predefined color scheme is provided and accessible via *View > Appearances > Library > startuptools*. This color scheme is ready to use and can also be customized.

## 2. Create and find model orientations (“Orientation Manager”)

With “Orientation Manager”, you can define model orientations.

The following functions are available:

- create new orientations (orthogonal projection, isometric projection, trimetric projection)
- view a list of existing orientations

## 3. Create standardized notes in 3D (“Stack Note 3D”)

The module *Stack Note* is used to select standardized information and place them in a note in a 3D model. The information elements are defined by the administrator in a multilingual database and can, for example, contain information on standards or regulations.

## 4. All annotations in Combined Views (“MBD Info”)

*MBD Info* provides you with a summarized view of the annotations present in the combined views. The module *MBD Info* is an enhancement of the module *Annotation Info* and opens in the navigation area. It offers additional features.



#### New features:

- a number in parentheses appears after each semantic icon, indicating the number of references.
- update entries in the table
- search bar to filter information
- semantic display for all annotation types (except tables)
- *Detail Info* as a new, compact information source (context menu)
- sort symbols by symbol definition using a configuration option



| Elements            | Visibilit | Semantic | Value | Type                     | Tolerance   |
|---------------------|-----------|----------|-------|--------------------------|-------------|
| gp13                | 1         | ✓ (10)   | 0.4   | ⊖ (Profile of a surface) |             |
| gp14                | 5         | ✗        | 0.02  | // (Parallelism)   B     |             |
| gp2                 | 5         | ✓ (2)    | 0.01  | ○ (Roundness)            |             |
| gp3                 | 5         | ✓ (2)    | 0.02  | — (Straightness)         |             |
| gp4                 | 5         | ✓ (4)    | 0.01  | // (Parallelism)   D     |             |
| gp5                 | 3         | ✓ (2)    | 0.02  | ≡ (Symmetry)   A         |             |
| gp8                 | 4         | ✓ (1)    | 0.01  | □ (Flatness)             |             |
| gp9                 | 4         | ✓ (1)    | 0.2   | ⊖ (Profile of a surface) |             |
| ▼ Datum Tag         |           |          |       |                          |             |
| AE_SET_DATUM        | 5         | ✓ (2)    | A     |                          |             |
| AE_SET_DATUM        | 5         | ✓ (1)    | B     |                          |             |
| AE_SET_DATUM        | 5         | ✓ (1)    | C     |                          |             |
| dt7 - C1            | 5         | ✗        | C1    |                          |             |
| dt8 - C2            | 5         | ✗        | C2    |                          |             |
| ▼ Driving Dimension |           |          |       |                          |             |
| DRV_DIM_D0 - d      | 2         | T        | 36    | General                  | +0.3 / -0.3 |
| DRV_DIM_D1 - d      | 2         | T (2)    | 60    | General                  | +0.3 / -0.3 |
| DRV_DIM_D4 - d      | 2         | T (2)    | 60    | General                  | +0.3 / -0.3 |
| DRV_DIM_D6 - d      | 3         | ✓ (2)    | 100   | h9                       | 0 / -0.087  |
| DRV_DIM_D7 - d      | 2         | T        | 30    | General                  | +0.2 / -0.2 |
| DRV_DIM_D8 - d      | 5         | ✓ (2)    | 40    | H8                       | +0.039 / -0 |
| Driven Dimension    |           |          |       |                          |             |
| Surface Finish      |           |          |       |                          |             |
| ▼ Symbol            |           |          |       |                          |             |
| symbol_14           | 1         | ✗        |       | SFELD-KLEIN              |             |
| symbol_26           | 1         | ✗        |       | TEDS-NACH-PRT-MDI        |             |
| Note                |           |          |       |                          |             |

## 5. Generating MBD tables (“MBD Tables”)

The module *MBD Tables* can be used to create and update tables for parts. The module consists of the following submodules:

### – Surface Finish Table

Create a summary table of all surfaces finishes in a view. You can save and use different templates for this table.

The screenshot shows the 'GENIUS TOOLS Surface Finish Table' dialog box. It has a title bar with a question mark and a close button. The 'Template' dropdown is set to '01-Surface finish colors ISO 21920 - DE'. Below it is a 'Properties' section with three dropdowns: 'Type' set to 'Horizontal Table', 'Sort' set to 'Value', and 'General Surface Finish' set to 'Keine Bearbeitung' (with a yellow warning icon). There are two checked checkboxes: 'Colorize' (with a yellow warning icon) and 'Transfer Annotations'. At the bottom left is the 'GENIUS TOOLS' logo, and at the bottom right are 'Create' and 'Close' buttons.

### – Size Table

Create a summary table of all sizes in a view. You can save and use different templates for this table.

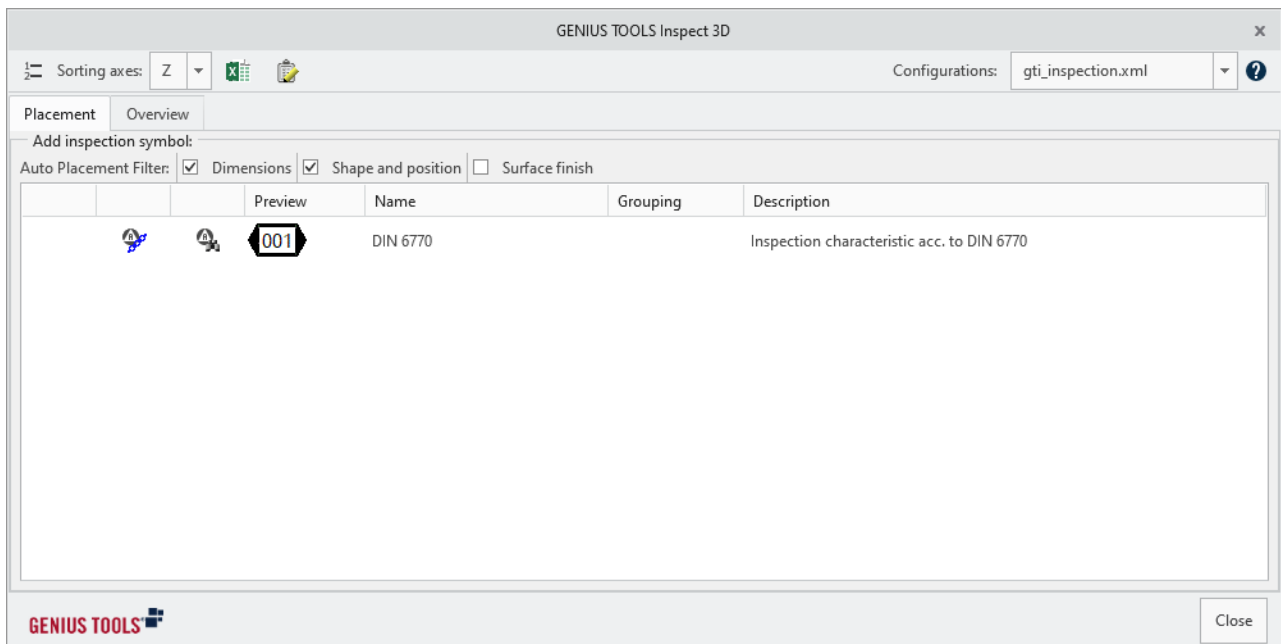
The screenshot shows the 'GENIUS TOOLS Size Table' dialog box. It has a title bar with a question mark and a close button. The 'Template' dropdown is set to '01-Colors for tolerances company'. Below it is a 'Properties' section with two dropdowns: 'Type' set to 'Vertical Table' and 'Sort' set to 'Value'. There are two checked checkboxes: 'Colorize' (with a yellow warning icon) and 'Transfer Annotations'. At the bottom left is the 'GENIUS TOOLS' logo, and at the bottom right are 'Create' and 'Close' buttons.

## – Update Tables

Every table in the current view is updated.

# 6. Inspection and change symbols for parts and assemblies (“Inspect 3D”)

*GENIUS TOOLS Inspect 3D* allows you to add inspection symbols to parts and assemblies in Creo Parametric. *GENIUS TOOLS Inspect 3D Revision* allows you to create a revision history of all symbols.



*GENIUS TOOLS Inspect 3D* is available in part mode and assembly mode with the following features:

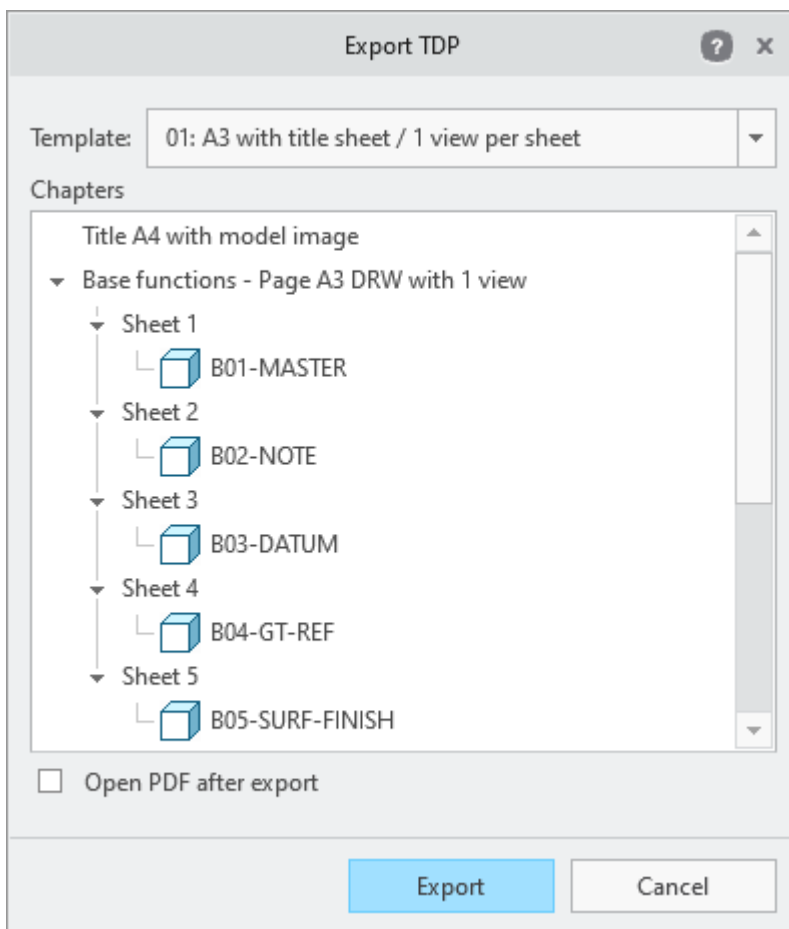
- Placing inspection symbols linked to
  - Dimensions
  - Shape and position tolerances
  - Surface finish symbols
  - Notes
  - Symbols
- Numbering of inspection symbols
  - By axes
  - By symbol type
  - Similar to DIN 6770 (numbers are not assigned anew)
- Exporting data to Excel

*GENIUS TOOLS Inspect 3D* is configured in *GENIUS TOOLS Inspect Editor*. The same Editor is available for *GENIUS TOOLS Inspect* in drawing mode and *GENIUS TOOLS Inspect 3D* in part mode and assembly mode. Some settings / configuration options can only be set for

GENIUS TOOLS *Inspect* in drawing mode or for GENIUS TOOLS *Inspect 3D* in part mode and in assembly mode.

## 7. Generating technical data packages (“Export TDP”)

The module *Export TDP* allows you to export technical data packages for viewing 3D models as PDF files. These PDF files contain figures of the MBD model that can be rotated, zoomed and resized.

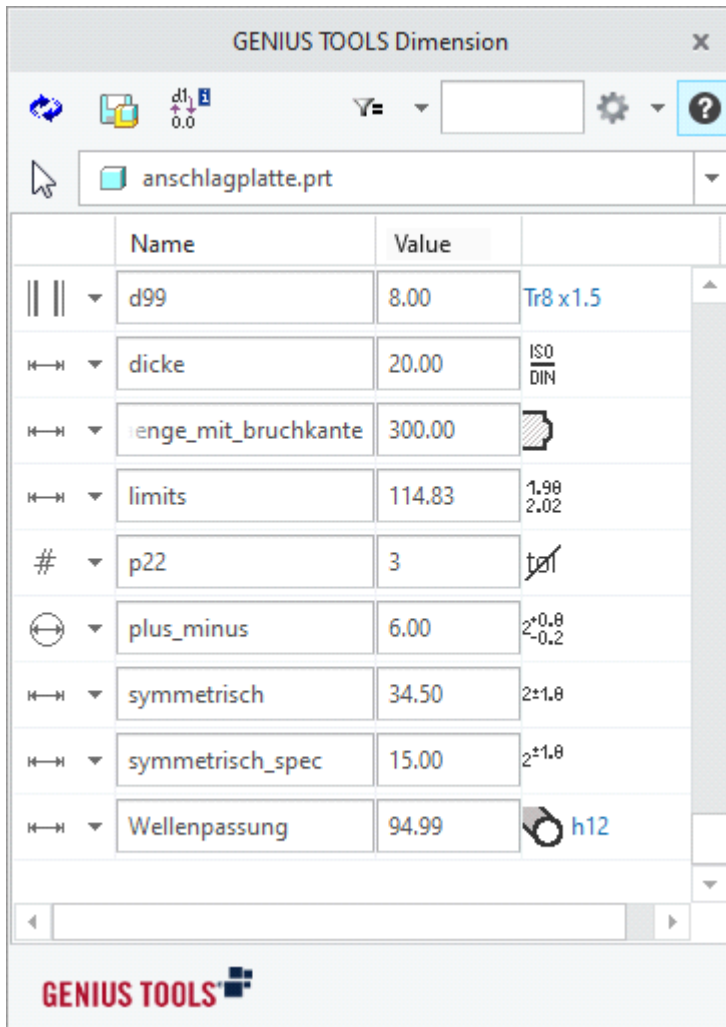


The exported PDF files can be created in the following ways:

- Structuring PDF files by chapters
- Optional content: Title page, table of contents, chapters with one or more combined views
- Format: classic drawing format with drawing frame or book format without drawing frame

## 8. Multi-dimensional editing (“Dimension“)

The component *Dimension* allows simultaneous and fast editing of dimension values and names of a feature, a complete part, an assembly or the subcomponents of an assembly, as well as variable UDF dimensions.



The following functions are available:

- display and modify dimensions with properties: dimension type (linear, angle, diameter, radius, thread), name, dimension value, tolerance type, dimension status (e.g. in relations, family tables)
- filter displayed dimensions by name, dimension type and tolerance type
- free text search for dimensions including auto-suggest function
- highlight dimensions in the graphics window when selecting a value in the *GENIUS TOOLS Dimension* user interface
- rename dimensions
- links for quickly accessing the Creo ribbon menu *Dimension* and the Creo dialog *Relations* (for relation-driven dimensions)
- quickly assign dimensions to family tables

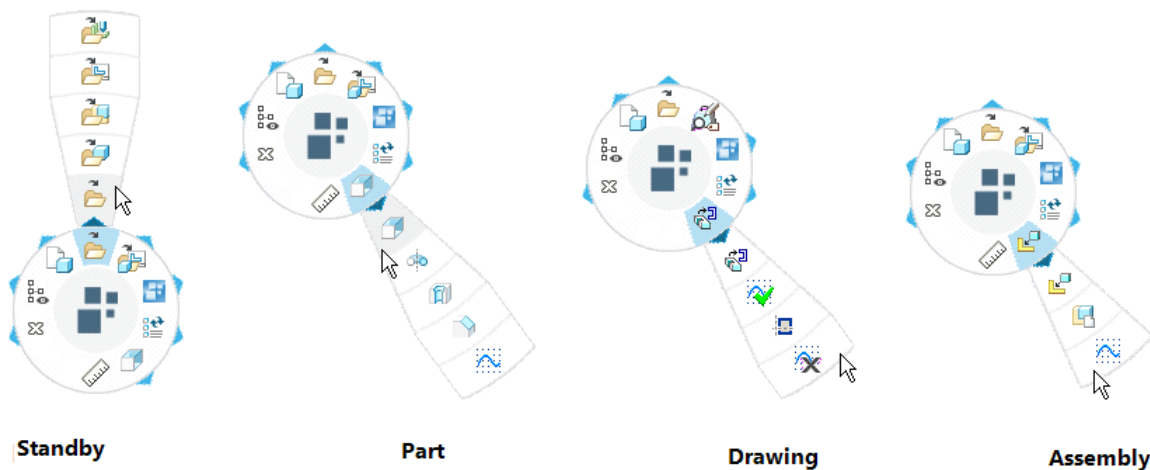
- save the values as a CSV file

## 9. Name Generator

The component *Name Generator* assigns names with sequential numbering for file names of parts, sheet metal parts and assemblies. Name Generator can be used both individually on stand-alone workstations (local) and in a network (global).

## 10. Ring menu and mapkey management (“Quick Access”)

The component *Quick Access* is a ring menu that provides quick access to suitable commands in different Creo modes and can include individually configurable mapkeys (macros).



The following functions are available:

- Using regular and intelligent mapkeys, i. e. using variables, parameters and placeholders
- Defining commands depending on mode and selection
- Different usage scenarios:
  - Central configuration
  - User-specific configuration
  - Simultaneous central and user-specific configuration
- Easy-to-use graphical editor for a homogeneous operating environment
- Exporting and importing all customized mapkeys with images and descriptions for easy data exchange

## 11. Configuration Utility

*Configuration Utility* is an interface for editing all configuration options and saving them to the correct locations.

The following functions are available:

- Viewing, modifying, commenting and deleting individual configuration options for each level
- Quickly checking different configuration variants using the memory function of variants

## 12. Further useful tools (“Utilities”)

In addition to these modules, there are a number of new utilities, e. g. to help you work with references, annotations and contact surfaces.

### 12.1 Annotation Info

*Annotation Info* provides you with a summarized view of the annotations present in the combined views.

| Elements                         | Visibility | Semantic | Value | Type | Tolerance | Combined Views             |
|----------------------------------|------------|----------|-------|------|-----------|----------------------------|
| ▶ Geometric Tolerance (14 1)     |            |          |       |      |           |                            |
| ▼ Datum Tag (6 0)                |            |          |       |      |           |                            |
| AE_SET_DATUM_TAG_A - Datum_Tag_A | 5          | ✓        | A     |      |           | B01-MASTER   B03-DATUM   I |
| AE_SET_DATUM_TAG_B - Datum_Tag_B | 5          | ✓        | B     |      |           | B01-MASTER   B03-DATUM   I |
| AE_SET_DATUM_TAG_C - Datum_Tag_C | 5          | ✓        | C     |      |           | B01-MASTER   B03-DATUM   I |
| Datum_Tag_D                      | 3          | ✓        | D     |      |           | B03-DATUM   B04-GT-REF   F |
| dt7 - C1                         | 5          | ✗        | C1    |      |           | B01-MASTER   B03-DATUM   I |
| dt8 - C2                         | 5          | ✗        | C2    |      |           | B01-MASTER   B03-DATUM   I |
| ▶ Driving Dimension (15 0)       |            |          |       |      |           |                            |
| ▶ Driven Dimension (3 2)         |            |          |       |      |           |                            |
| ▶ Surface Finish (3 0)           |            |          |       |      |           |                            |
| ▶ Symbol (5 0)                   |            |          |       |      |           |                            |
| ▶ Note (5 1)                     |            |          |       |      |           |                            |

## 12.2 Annotation Transfer

Use *Annotation Transfer* to transfer annotations from one combined view to one or more other combined views.

GENIUS TOOLS Annotation Transfer

☒ ☐

☒ ☐

**Combined Views Input**

☐ B00-WORK  
☒ B01-MASTER  
☒ B02-NOTE  
☐ B03-DATUM  
☐ B04-GT-REF  
☐ B05-SURF-FINISH  
☐ F01-BEARING  
☐ DEFAULT ALL

**Combined View Output**

☐ B00-WORK  
☐ B01-MASTER  
☐ B02-NOTE  
☐ B03-DATUM  
☒ B04-GT-REF  
☐ B05-SURF-FINISH  
☐ F01-BEARING  
☐ DEFAULT ALL

**Filter**

☒ ☐

☒ ☐

☒ Note  
☒ Geometric Tolerance  
☒ Driving Dimension  
☒ Driven Dimension  
☒ Reference Dimension  
☒ Datum Tag  
☒ Symbol  
☒ Surface Finish  
☒ Table  
☒ Custom

**Options**

☒ Overwrite output view  
☐ Overwrite only selected filter types

GENIUS TOOLS

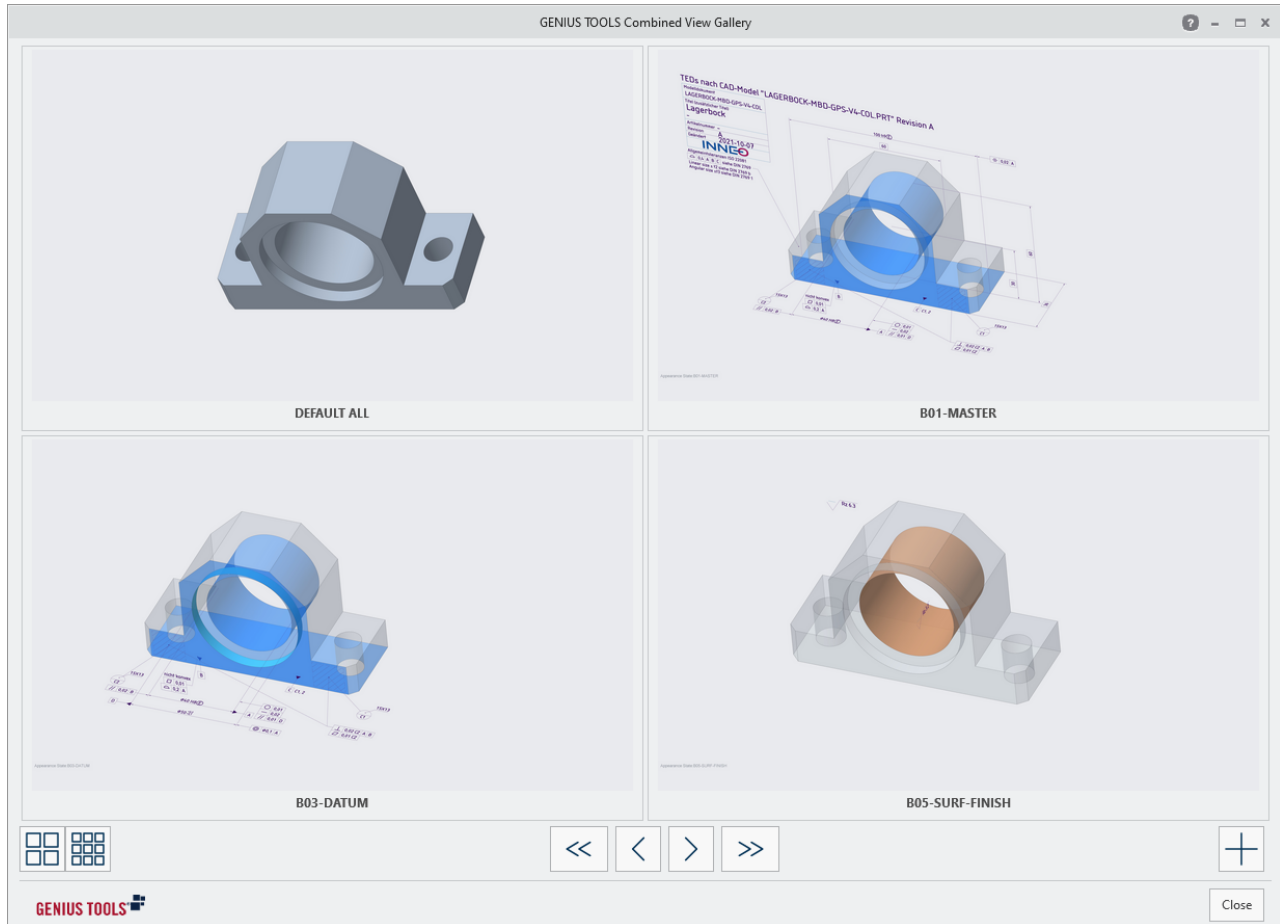
Transfer

Close



## 12.3 Combined View Gallery

*Combined Views Gallery* provides a quick overview of all combined views in a model.



## 12.4 Extended editing of annotation texts (“GTOL Text”)

*GTol Text* allows you to edit texts of existing shape and position tolerance annotations. Set up templates for these texts and links to more information using *GTol Text Editor*.

## 12.5 Find Contact Surfaces

*Find Contact Surfaces* is an analysis tool that searches for the adjacent surfaces to a selected surface (=contact surfaces).

## 12.6 Find References

*Find References* enables the automatic assignment of references to dimensions and finds for displayed dimensions the corresponding semantic references. References that are not found can be assigned manually. It also creates the semantics for Creo Parametric model dimensions that are specified by ISO GPS standards.

| GENIUS TOOLS Find References                                                          |       |        |      |  |  |
|---------------------------------------------------------------------------------------|-------|--------|------|--|--|
| <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |       |        |      |  |  |
| Dimension                                                                             | Value | Status | Type |  |  |
| <input checked="" type="checkbox"/> DRV_DIM_D59 - d59                                 | 6.6   | ✓      | H-H  |  |  |
| <input checked="" type="checkbox"/> DRV_DIM_D207 - d207                               | 117.4 | ✓      | H-H  |  |  |
| <input checked="" type="checkbox"/> DRV_DIM_D16 - d16                                 | 235   | ✓      | H-H  |  |  |
| <input checked="" type="checkbox"/> DRV_DIM_D61 - d61                                 | 226.6 | ✓      | H-H  |  |  |
| <input checked="" type="checkbox"/> DRV_DIM_D56 - d56                                 | 234.8 | ✓      | H-H  |  |  |
| <input checked="" type="checkbox"/> DRV_DIM_D49 - d49                                 | 220   | ✓      | H-H  |  |  |
| <input checked="" type="checkbox"/> DRV_DIM_D108 - d108                               | 204.5 | ✓      | H-H  |  |  |
| <input checked="" type="checkbox"/> DRV_DIM_D241 - d241                               | 210   | ✓      | H-H  |  |  |
| <input checked="" type="checkbox"/> DRV_DIM_D242 - d242                               | 212   | ✓      | H-H  |  |  |
| AE_DRIVEN_DIM2 - ad221                                                                | 184   | ✗      | H-H  |  |  |
| AE_DRIVEN_DIM1 - ad216                                                                | 178   | ✗      | H-H  |  |  |
| DRV_DIM_D204 - d204                                                                   | 17    | ✗      | H-H  |  |  |

GENIUS TOOLS

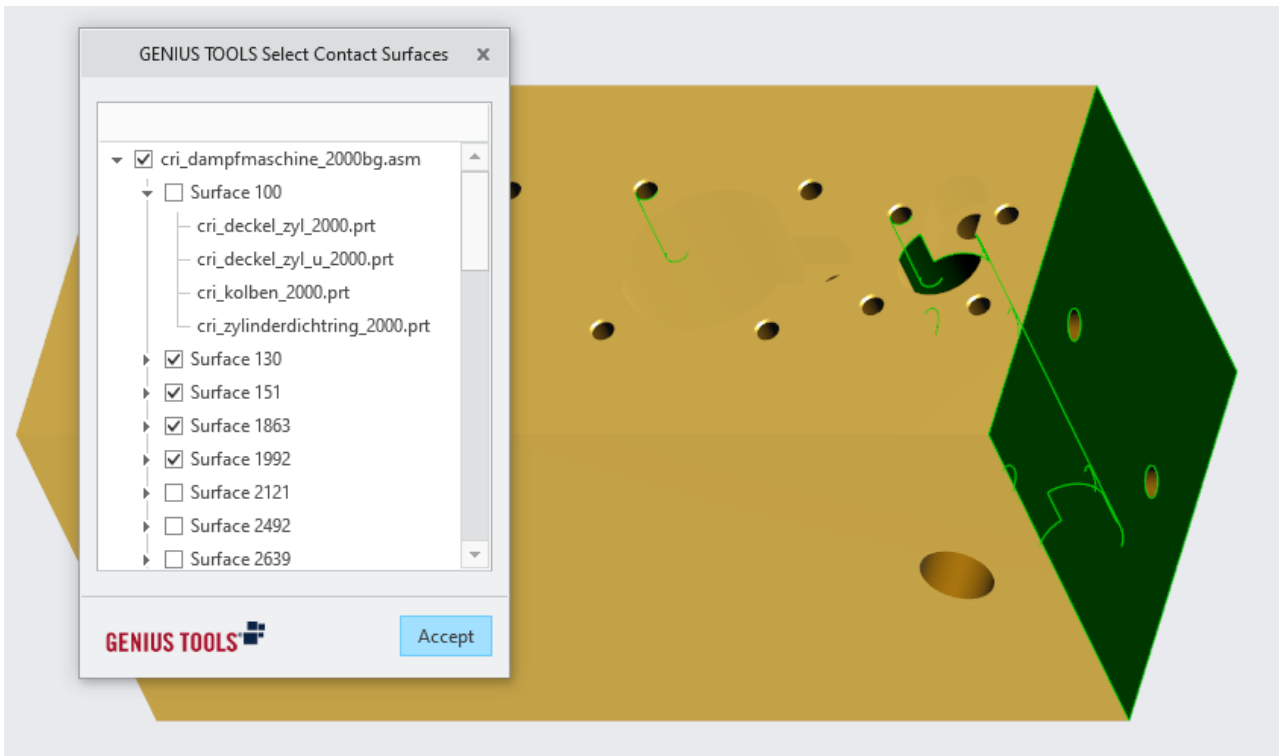
Reference Close

## 12.7 Referencing surfaces to the general tolerance (“GenTOL References”)

*GenTOL References* references all available surfaces to the general tolerance. The number of referenced surfaces is listed in the message log.

## 12.8 Select Contact Surfaces

View the contact surfaces found with *Find Contact Surfaces* and select them for further processing, e. g. coloring with *Function Manager*.



## 12.9 Sort Combined Views

Combined views are sorted in alphabetical order after they are generated manually. *Function Manager* also allows you to automatically create new combined views in alphabetical order.

## 12.10 Set TED Dimensions

Set all TED dimensions in the opened part / assembly.



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INNEO Solutions GmbH  
IT-Campus 1  
73479 Ellwangen  
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