
TECHNICAL INFORMATION

NOTE N° 68

Author : Xavier ROBIN - Jean-françois GIMENEZ

Date : 09/03/2006

Subject : Big assemblies - Optimization

Version : 6.7.258

To : Supports, Vars, Export

Configure correctly Topsolid'Design and Topsolid'Draft can improve the performances.

Here are the necessary steps :

1- 3D model configuration – TopSolid'Design

- Facetisation tolerance
- File size
- Facets number (img/s)
- Template document
 - Transparency
 - Display speed
 - Silhouette
 - Textures
- Simplification mode
 - Simplification cursor
 - Simplified shape
 - Alternative Sets

2- 2D template configuration – TopSolid'Draft

- Template document
 - Projection parameters
 - Filter of view creation
 - Tapping projection
 - Update of views option
 - Bill of material
 - Title block (Mass, Volume)
 - Center of mass

3- DFN Processing (Step, Iges, etc.)

1- 3D model configuration

Facetisation tolerance

File size – facets number (img/s)

It is important to increase the rendering tolerance in order to :

- Reduce the number of facet to be displayed
- Increase the images per second rate.
- reduce the file size
- reduce the loading time of the file

Example with an assembly file

(The characteristics of the file will be the reference for all the results of this document) :

Characteristics :

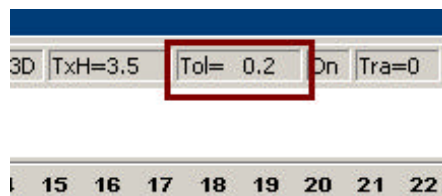
12 206 elements

3007 shapes

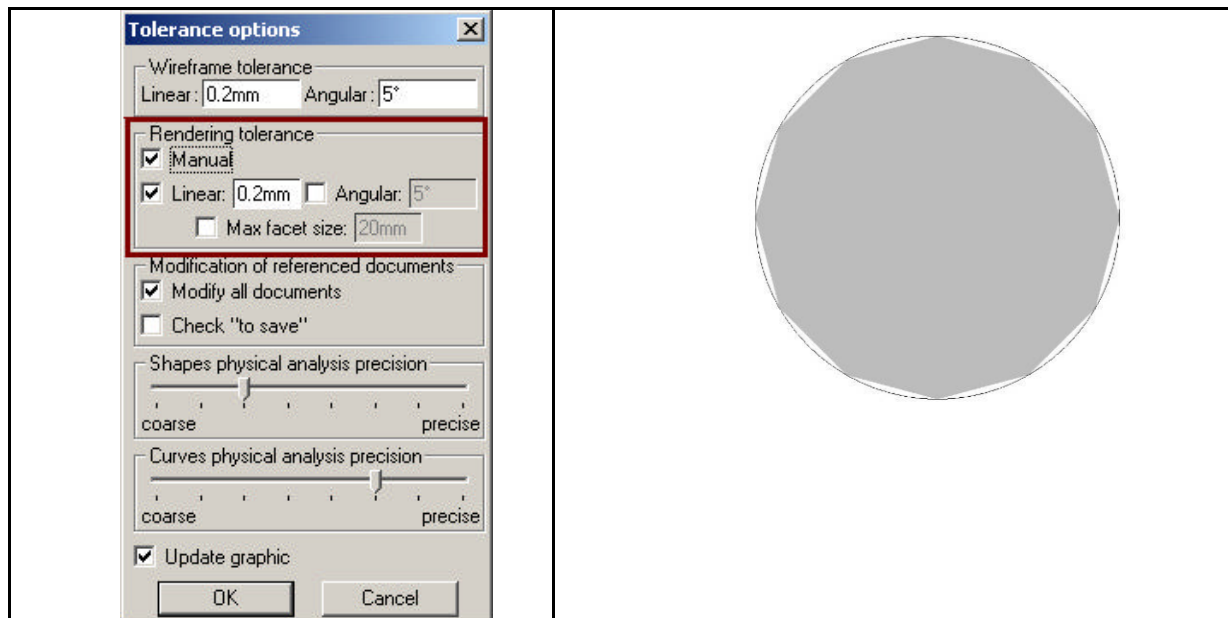
Assembly file with 495 links for a maximum of 4 levels of folders.

2500 elements into the bill of material among which 1049 fastener elements

In the status bar, activate the function « change tolerancy »



Into the dialog box « Tolerances options », it is possible to modify the rendering tolerance without modifying the wireframe tolerance.



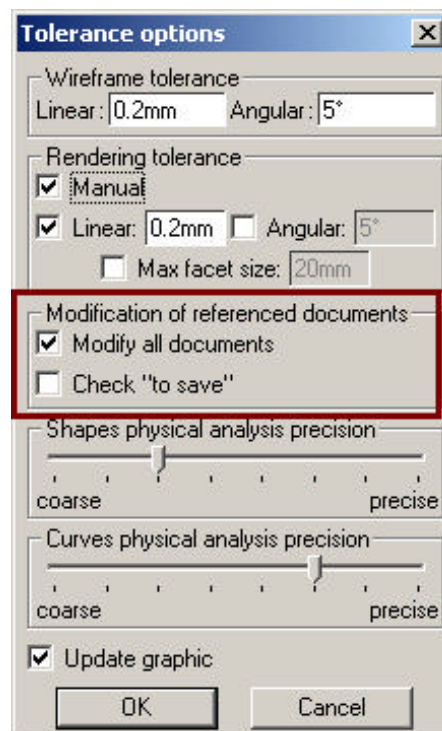
By setting this tolerance, you can get interesting benefits :

0.02mm / 5° - 2 269 334 facets

1 mm / 5° - 642 203 facets

	BEFORE (0.02mm / 5°)	AFTER (1 mm / 5°)	GAIN
File size	181 Mo	128 Mo	GAIN 29%
Loading time	2mm 09s (129s)	1mm 45s (105s)	GAIN 18%
Number of images / s	0.8 img/s	6.5 img/s	X 8.1

With TopSolid 2006, it is possible to change the display tolerance of an assembly file and all its linked files (except for standards library elements).

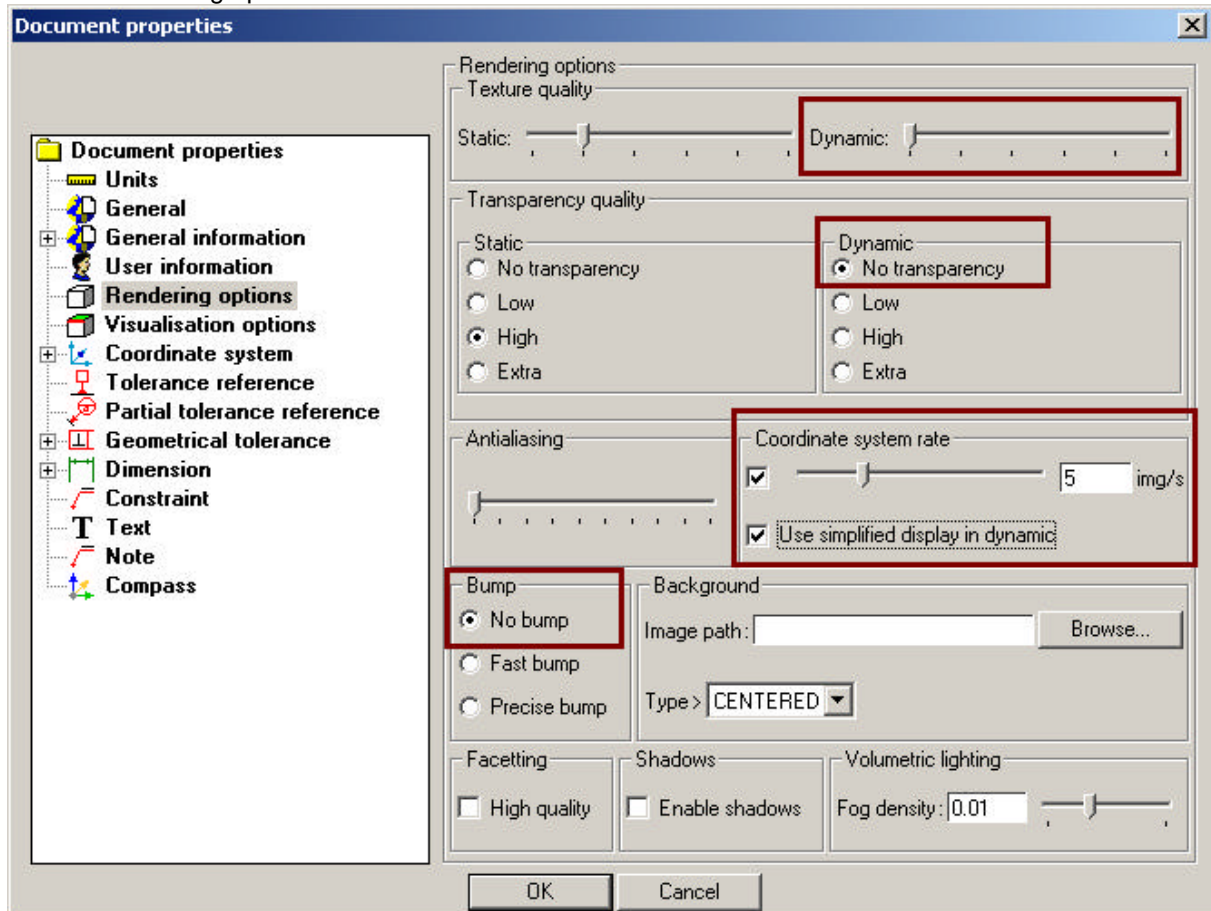


- It is recommended to create a template document according to the dimensions of the part (micro mechanic, welded structure, roof framework) and the type of document (assembly, single part).

Template document

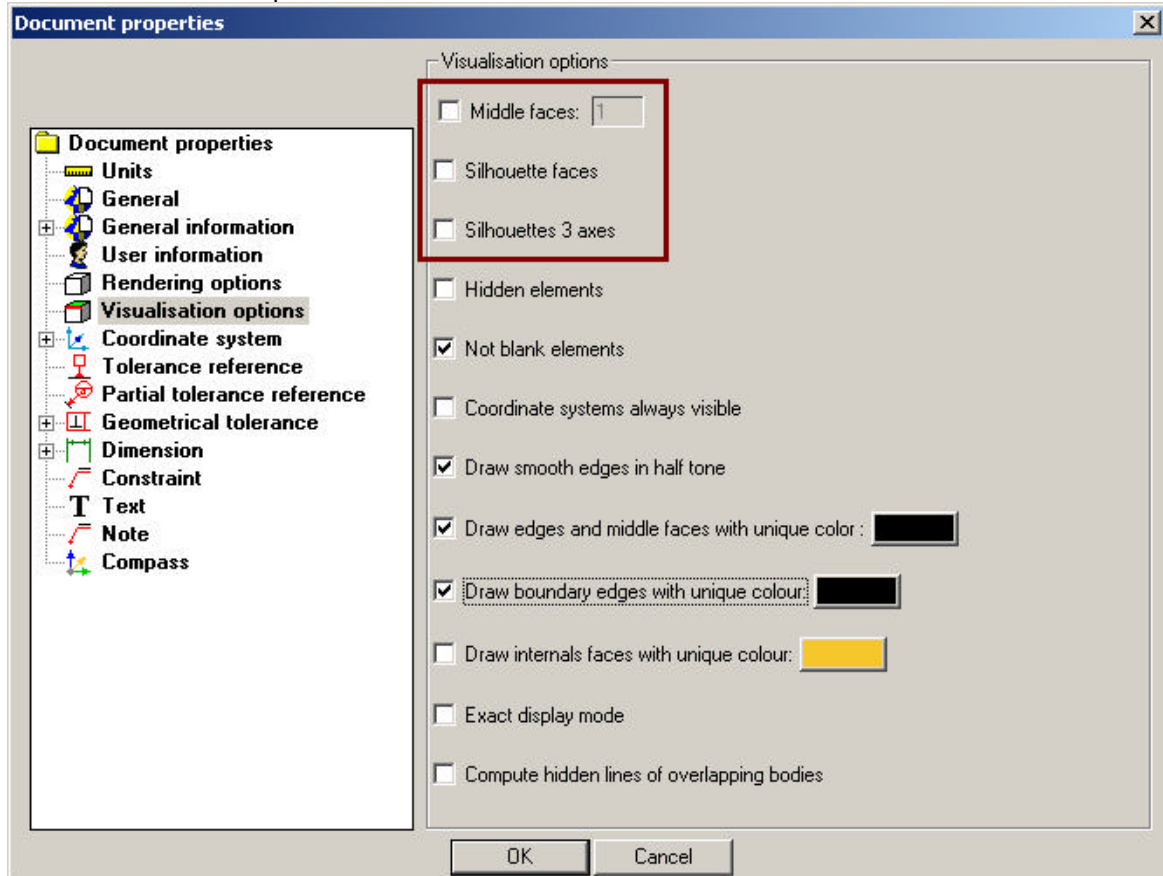
Transparency - Display rate - Silhouettes - Textures

Rendering options

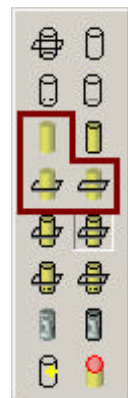


- Reduce the texture quality for dynamic mode.
- Deactivate or reduce the transparency for static and dynamic modes: some graphic boards have a very important loss of display rate (img/s) when transparency is used. It is better to deactivate it in dynamic mode.
- Force the display rate : in dynamic mode, this hide from the scene the parts that are very complex to display in order to keep the given display rate.
- Activate the simplified display in dynamic that allows to display enclosing bloc instead of the real part during dynamic moves.
- Avoid to activate the bump of textures.

Visualisation options



- Deactivate « silhouette faces » : this option need a computation of the entity silhouette ; which explain a latency perdioid at the end of the dynamic move.
- « 3 axes silhouettes » is easier to compute.
- It is the same for the middle faces option.
- The render modes « shading » or « shading + wireframe - hidden lines », « shading + wireframe » do not take this option in considerations as edges are not displayed.



Simplification mode

Simplification cursor – Simplified shape – Alternative Sets

An other complementary method also allows to reduce the number of facets on a shape.

For each construction history of a Part / Set, it is possible to create a simplified shape of the part through two different ways :

- 1- Simplification cursor.
- 2- Simplified shape

Detailed Mode



Simplified Mode



Detailed Mode



Simplified Mode



This gives several advantages :

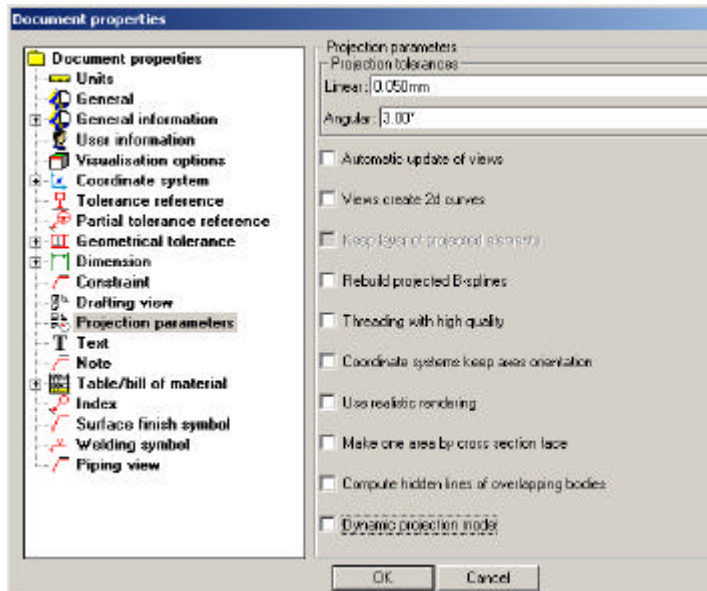
- Reduce the number of facet and thus increase the display rate.
- Provide the possibility to include parts in simplified mode and keep the information of constraint positioning.
- Create a quick drawing (with indexes and bill of material).

2- 2D template configuration

Template document

Projection parameter

It is necessary to configure properly the templates drawing :
`$TopHome\config\template*.dft`

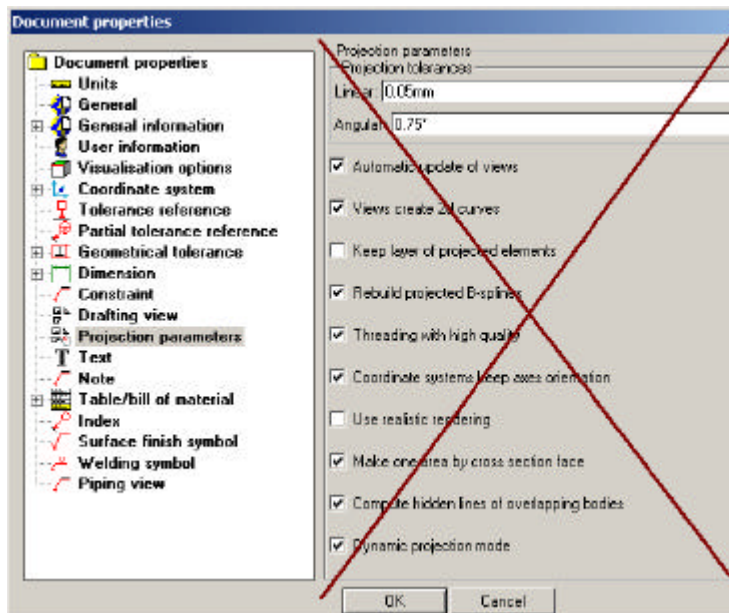


Deactivate :

- Automatic update of views.
- Views create 2D curves.
- Threading with high quality

You can also adjust the linear projection tolerance according to the global dimensions of the projected element (common value between 1mm and 0.05mm)

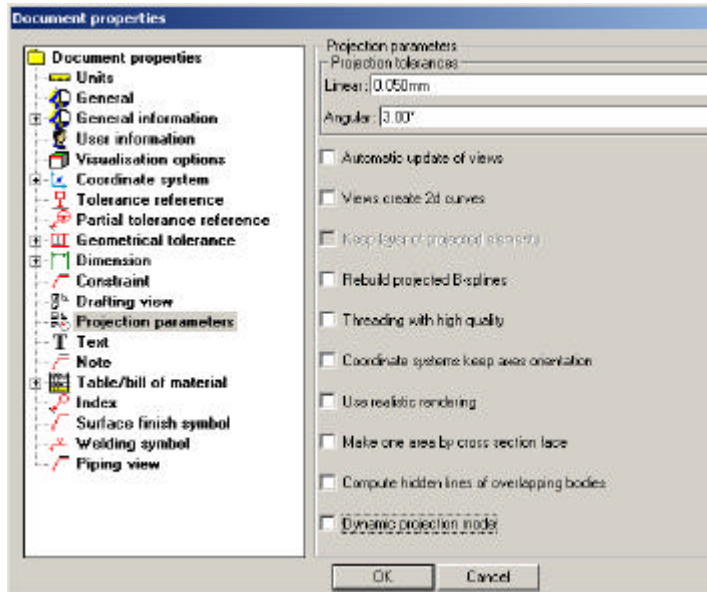
Here is an illustration of the performance improvement :



With the following options activated, the projection duration is :

40mn 35 s (2435s)

(The angular tolerance has been reduced to 0.75° .)



If the options are deactivated, the projection duration is :

2mm 55s (175s)

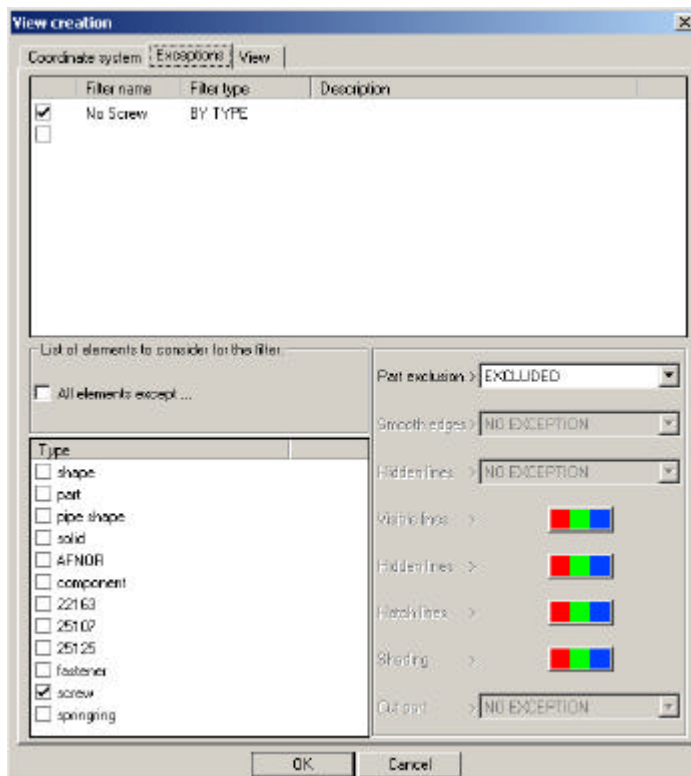
13.9 time faster

By setting only the angular projection tolerance to its default value(3°), the gain is very important.

8mm 57s (537s)

4.5 time faster

View exceptions



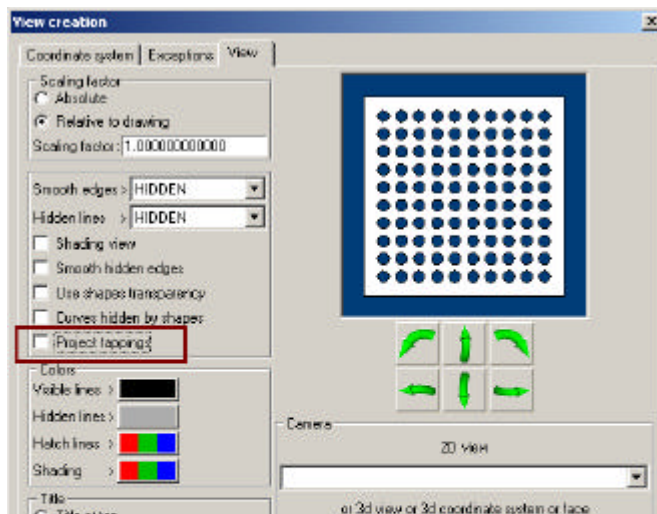
When creating main view or an auxiliary view, it is possible to filter elements from the view.

- by type
- by manual selection
- by size

Example : if all the screws are excluded (they represent 1/3 of the volumic entities), the gain is interesting:

1mm33s (93s)
26.18 time faster

Tapping projection



With TopSolid 2006 (patch 6.7.258), by adding the following line into \$TopHome/config/top.cfg:

```
D_SH_OP_DRILL_TAPPING_THREADING[tab]1
```

A new option in the view creation dialog box allows to not project the threadings

File with screw and without tapping :

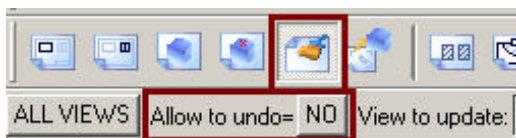
2mm 11s (131s)
18.6 times faster

File without screw and without tapping :

1mm 18s (78s)
31.1 times faster

“Allows undo” option from « regenerate view » function

Function : View | regenerate



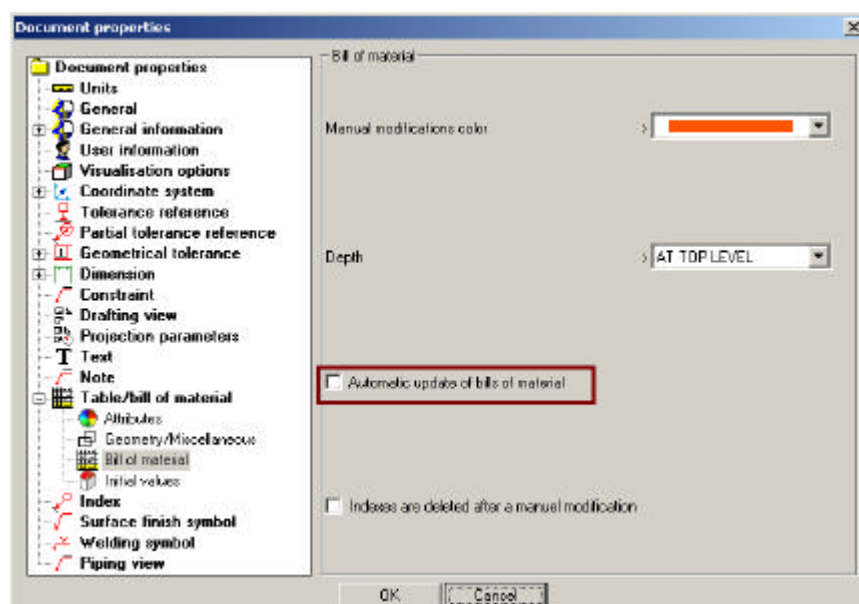
Option : Allow to undo (YES / NO)

This option allows to update the projected view but by deactivating the undo feature afterwards

This allows to reduce the memory used when regenerating views.

Bill of material

The same as the automatic update of views, it is important to deactivate the automatic update of the bill of material.



Title block

The title block can have a cell that are automatically filled as the mass ; it is advised not to insert this property into the template document but afterwards if needed.

Gravity center

In a 3D document, it is best not to keep the barycenter points (if they are not used in the construction), this avoid to recompute it each time a shape is modified.

3- DFN Processing (Step, Iges, etc.)

TopSolid allows to check and simplify the entities that comes from external files.

Caution: the checking of the geometry (Shape | Manage | Check geometry) is essential before to use the part in an assembly. An invalid topology may bring failure while creating a projected view.

The functions « Shape | Manage » allow to :

- Simplify a geometry (get real planar, cylindrical and conical faces) to reduce the number of facets (and so increase the display rate) and also gives the possibility to position and work on these parts more easily (constraint positioning, axis creation, etc...)