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Intermediate Tooling Tutorial



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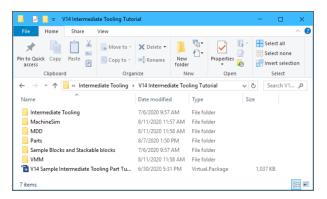
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INTERMEDIATE TOOLING TUTORIALS

The easiest and most effective way to learn how to use Intermediate Tooling is to actually create a toolblock and add it to a toolblock library. This is what we will show in this tutorial.

Loading Sample Files

First we must load the files required for this tutorial. In the sample parts folder you will find a folder called V14 Intermediate Tooling tutorial. This folder contains 6 directories, the contents of which will need to be put in the following locations:



1. Copy the contents of the Intermediate Tooling, MachineSim, MDD and VMM folders to the corresponding folders on your system. They will be located here:

C:\ProgramData\3D Systems\GibbsCAM\<version>\

- 2. Drag the folder Sample Blocks and Stackable blocks to your desktop.
- 3. Open the Parts folder and drag the file V14 Sample Intermediate Tooling Part.vnc to your desktop.

Intermediate Tooling Preferences

We will now look at the Preferences that can be set for Intermediate Tooling.

Open the File / Preferences dialog and click the Intermediate tooling option.



Preferences	
Display	Int. Tooling
Interface Machining Prefs File Import/Export Auto Save Coordinate Systems	Data Folder Location <pre> System C:\ProgramData\3D </pre> User C:\ProgramData\3D
Post Processor Comments Com Set-Up Int. Tooling G-Code Editor Settings Additive	Image View Type Quick View Opynamic View

Image View Type can be changed to Quick view if you find that your images are loading too slowly, however Dynamic view enables you to pan around the toolblocks and examine them properly so it is preferable to leave this as the default view.

It is also possible to set up your own location for Intermediate tooling files, simply by clicking the User option for the Data Folder Location and typing your preferred directory location.

This is recommended as it has the advantage that you can always keep the same file location, instead of migrating the files from each software version to the next.

For this tutorial we will be using the default system location for the Intermediate Tooling files.

Creating a new Toolblock library

1. Go to Main Menu File>Intermediate Tooling> Toolblock Library and click Create.

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2. Name this new Toolblock library Tutorial2.

Create N	lew Toolblock Library		×
Name	Tutorial2		
		Create	Cancel

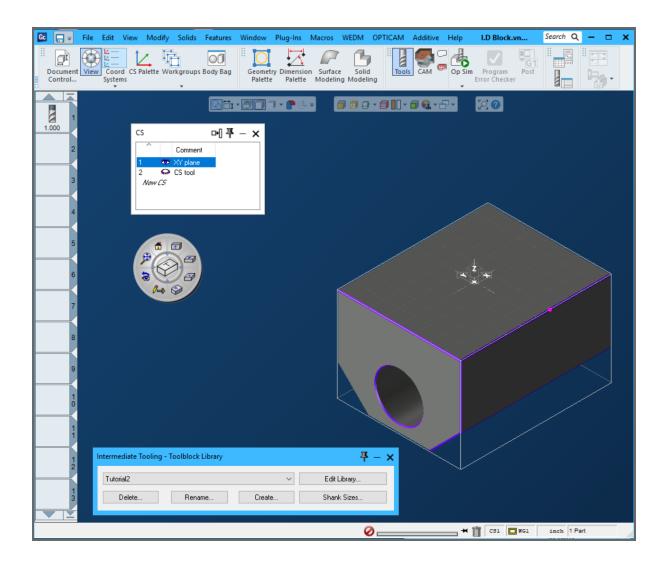
Now we will add a toolblock to the Library.

 Open the Sample Blocks and Stackable blocks folder on your desktop and drag the first file, I,D Block.vnc into your Gibbs Workspace.

in to Quick Copy	Paste	🙀 Move to 🌱	X Delete -	New folder	Properties			t none t selection
Clipboar	d	Orga	inize	New	Ope	n	Se	lect
← → * ↑	< V14 In	termediate T →	Sample Blocks	and Stacka	ble blocks	~ Ō	Sear	ch Sa 🔎
Name	^		Date modified	тур	pe	Size		
1.D Block.vnc			6/30/2020 5:3	I PM Git	bsCAM Part Fi	le	425 KB	
1 Single Turn Bl	ock Holder T	utorial.vnc	6/30/2020 5:3	I PM Git	bsCAM Part Fi	le	460 KB	
🔞 Sleeve .250 .vr	ic		6/30/2020 5:3	1 PM Git	bsCAM Part Fi	le	480 KB	
🚡 Sleeve .375 .vr	ic		6/30/2020 5:3	I PM Git	bsCAM Part Fi	le	572 KB	
Sleeve .500 .vr	ic		6/30/2020 5:3	I PM Gib	bsCAM Part Fi	le	434 KB	
🐻 Sleeve .750.vn	c		6/30/2020 5:3	1 PM Gib	bsCAM Part Fi	le	509 KB	
🚡 Sleeve 1.0.vnc			6/30/2020 5:3	I PM Gib	obsCAM Part Fi	le	669 KB	

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4. Examine the part. Open the CS list, you will note that there are two coordinate systems. CS1 which will always represents the root coordinate system of the toolblock. CS1 defines the attachment point to the machine, with Z- facing the turret.



CS2 represents the tool attachment point, with the negative depth axis showing the direction the tool will stick out. (A greater negative value would make the tool stick out more.)

In the Intermediate Tooling dialog, click Edit Library. The Toolblock Data dialog opens. You are presented with a set of options. These options can be valuable to sort large toolblock libraries. Care must however be taken, as checking a particular tool or fitting type will exclude this toolblock from being available with any of the other tool or fitting types.

Types

5. We will leave the Types options blank which will allow us to use this toolblock for any tool.

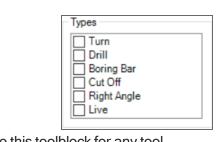
Fitting Type

Much like the Types option, you can also filter the blocks as to which fitting they can be attached to.

ATC Backend and Collet come with a library of standard fittings. For the other options you supply the Height and Width specifications.

- 6. Again, we will leave this as Any to enable the block to be used with any tool.
- Setup Offsets

If this toolblock has fittings which allow it to be attached to the turret with offsetting, this is where you specify which axis(es) can be adjusted. The actual offset amount is specified within Tool setup Data within the Tool dialog.

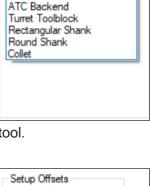


Fitting Type

Any

Other

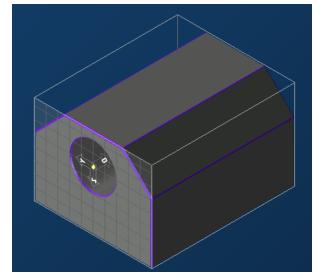
ПХ



ΠY

Multiple Orientations

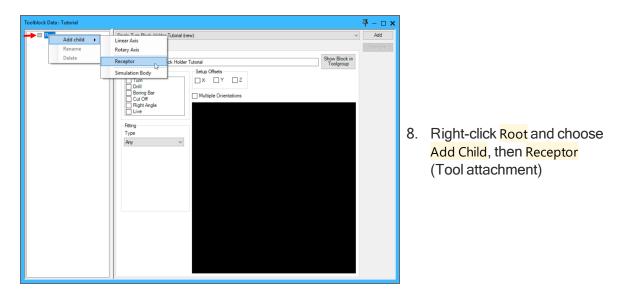
□ Z



Similarly, if the toolblock can be used in Multiple Orientations, checking this enables you to specify how many orientations. Again locations are set up within the Tool dialog.

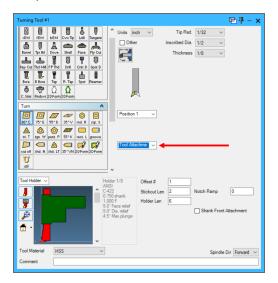
7. We will leave these options blank also.

We must now enter the attachment details for the block, which is set up much like a "tree" structure in the panel down the left side of the dialog.



9. You will be prompted to add a label for the node. Type Tool attachment.

(This label will appear in the Tool Position dropdown of a Tool dialog as shown in the illustration below.)



We will now specify the attachment point on the block.

We can define the Receptor (Tool attachment) type here if you wish to sort and filter the receptors. Again, care must be taken with this as you may filter out valid options by mistake. We will keep this as Any.

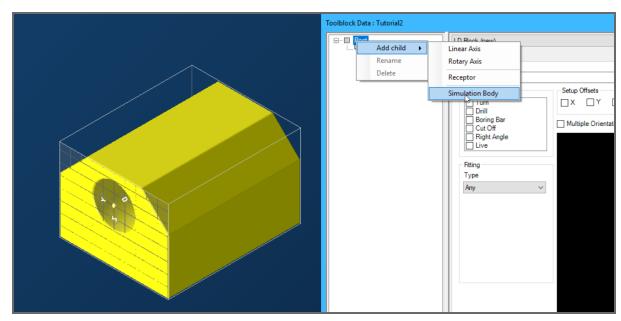
We must now select a body to be displayed in simulation.

10. Ensure the CS selected is CS2 (the

Current CS.

attachment CS) and click the option From

11. Select the part (it will turn yellow) and in the dialog right-click the Root node and choose Add child/Simulation Body.



The Body Property name of the toolblock appears by default. Note that the checkbox Apply Selected is already checked. You can accept this label name, or choose your own, however it will only be visible in the Attachment Assembly dialog within intermediate tooling, not anywhere else.

🖳 Ado	l Sim Body	—		×
Label	Boring Bar Hol-	Extrude		
	ly Selected	OK	Can	cel

12. Click OK.

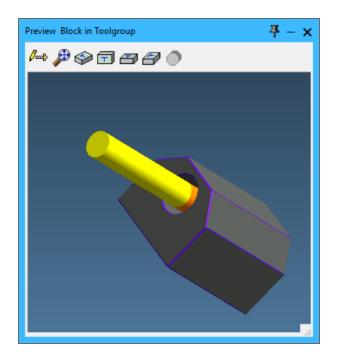
The Toolblock Data dialog will now look as follows.

Toolblock Data : Tutorial2			₽ – □ ×
Root Boring Bar Hol-Extrude Tool attachment	I.D Block (new) Simulation Body Apply Selected Select Body Name of Body Boring Bar Hol-Extrude	~	Add Remove

- 13. Click the Add button in the top right corner of the dialog to add the Toolblock to the library.
- 14. Now we should check that we have created the toolblock correctly.

	Document View Coord CS Palette Workgr		mension Surface Solid alette Modeling Modeling	Program ror Checker	" "}, .
15. Select a tool from the toollist,				20 - 4	
then click the option <mark>Show</mark> Block in Toolgroup.	6 7 9	G - III Root → Broot Borng Bar Hol-Een Tool attachment	ID Block General Post Data Name ID Block Types D'un	See Block in regree	nove

The Preview Toolgroup dialog opens, showing the tool correctly protruding from the holder.



Close this preview and the toolblock data dialog, but leave the Intermediate Tooling Library dialog open, we will be adding more toolblocks.

- 1. Open file Single Block Tool Holder Tutorial.vnc. You will be prompted to save changes in the previous file.
- 2. Click No, as the required files will already have been saved in the Intermediate Tooling directory when you added the block to the library. Check your Intermediate tooling directory. You should see the following files.

📕 I 🔽 📕 🖛 I 1	Tutorial2						_		×
File Home	Share	View							^ ?
Pin to Quick Copy access	Paste	👍 Move to 👻	X Delete ▾ ➡ Rename	New folder	¶∎• ₹]•	Properties	II - 2 €	Select	
Clipboar	d	Orga	nize	Ne	ew	Open	n		
$\leftarrow \rightarrow \cdot \uparrow$	« Interm	ediate Tooling >	Toolblocks >	Tutori	ial2	~	ڻ v	Search Tu	م
Name	^		Date modified	I	Туре		Siz	e	
I.D Block.bmp			7/28/2020 3:00	PM	BMP Fi	ile		603 KB	
🐻 I.D Block.vnc			7/28/2020 3:00	PM	GibbsC	CAM Part Fil	e	437 KB	
I.D Block_asy.x	ml		7/28/2020 3:00	PM	XML Fi	le		4 KB	
I.D Block1.fb2			7/28/2020 3:00	PM	FB2 File	e		150 KB	
Toolblocks.xm	h.		7/31/2020 1:37	7 PM	XML Fi	le		2 KB	
5 items									

- 3. In the Intermediate Tooling dialog click Edit library.
- 4. Right-click the Root node, select Add child then Receptor and label it Tool Attachment.
- 5. Click OK.

- 6. Open the Coordinate system dialog and ensure the Tool Position CS is selected (CS2).
- 7. Now click From Current CS in the Receptor tab.

Toolblock Data : Tutorial2		₽ – □ ×
- Root	Single Turn Block Holder Tutorial (new)	 ✓ Add
L Tool Attachment	Feceptor From Current CS Show Tool in Block Y 0 To New CS To New CS	Remove
	H Vector V Vector	

14 14 14 14

The coordinates are automatically loaded from the current CS (CS2).

Now we must add a simulation body.

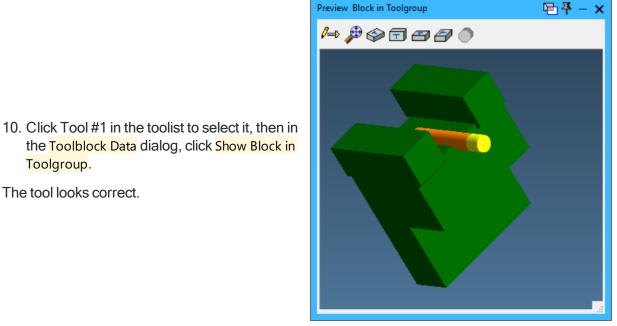
 Click the part body to select it, then right-click the Root node in the Toolblock Data dialog. Select Add child, then Simulation body. The Add Sim Body dialog appears. Accept the label (the name is taken from the Body Properties). Apply selected is already checked, so just click OK.

If you forgot to select the body you will need to type in a label name (which will only be visible in the toolblock Data dialog), click OK to close the label dialog. Now click the body to select it. You will then be able to select Apply Selected as shown below.

Toolblock Data : Tutorial2	
Root Inch Tum Blo+Extrude Tool Attachment	Single Tum Block Holder Tutorial* Simulation Body Apply Selected Select Body Name of Body T Inch Turn Blo+Extrude ID 22

9. Click Add in the top right of the dialog to add the Toolblock to the library.

Now we should check a tool can be correctly inserted in the block.



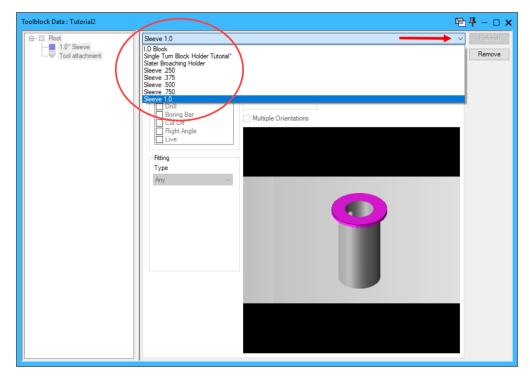
11. Close the Toolblock Data dialog, leaving the Intermediate Tooling dialog open.

Toolgroup.

The tool looks correct.

The next five toolblock files to be added are sleeves of varying sizes which will be used (stacked) in conjunction with the previous holders to actually hold the tools. They are added in exactly the same way as the previous files. You will notice the flanges are different colors to enable easy identification.

12. Click the dropdown arrow on the right of the toolblock title. The seven toolholders should appear as shown below.



- 13. You have now added all the toolblocks and can close the Intermediate Tooling dialog.
- 14. If you'd like to check, your Toolblock directory will look as follows:

File Home Share View				- 🗆 ×
Home Share View View	Move Copy	te Rename	Properties	Select all
Clipboard	Organize	New	Open	Select
← → × ↑ 📴 « 3D Systems → GibbsC	AM > 13.8.49 > Inte	rmediate Tooling > To	olblocks > Tutorial2	v ♂ Search Tu ,0
Name	Date modified	Туре	Size	
LD Block.bmp	7/28/2020 3:00 PM	BMP File	603 KB	
I.D Block.vnc	7/28/2020 3:00 PM	GibbsCAM Part File	437 KB	
I.D Block asy.xml	7/28/2020 3:00 PM	XML File	4 KB	
D Block1.fb2	7/28/2020 3:00 PM	FB2 File	150 KB	
Single Turn Block Holder Tutorial.bmp	8/6/2020 3:13 PM	BMP File	601 KB	
Single Turn Block Holder Tutorial.vnc	8/6/2020 3:13 PM	GibbsCAM Part File	477 KB	
Single Turn Block Holder Tutorial_asy.xml	8/6/2020 3:13 PM	XML File	4 KR	
Single Turn Block Holder Tutorial1.fb2	8/6/2020 3:13 PM	FR2 File	12 KB	
Sleeve .250 .bmp	8/6/2020 4:00 PM	BMP File	601 KB	
Sleeve 250 .vnc	8/6/2020 4:00 PM	GibbsCAM Part File	474 KB	
Sleeve 250 asy.xml	8/6/2020 4:00 PM	XML File	4 KB	
Sleeve .250 1.fb2	8/6/2020 4:00 PM	FB2 File	358 KB	
Sleeve .375 .bmp	8/6/2020 4:02 PM	BMP File	601 KB	
Sleeve .375 .vnc	8/6/2020 4:02 PM	GibbsCAM Part File	553 KB	
Sleeve .375_asy.xml	8/6/2020 4:02 PM	XML File	4 KR	
Sleeve .375 1.fb2	8/6/2020 4:02 PM	FB2 File	364 KB	
Sleeve .500 .bmp	8/6/2020 4:03 PM	BMP File	601 KB	
Sleeve .500 .vnc	8/6/2020 4:03 PM	GibbsCAM Part File	434 KB	
Sleeve .500 asy.xml	8/6/2020 4:03 PM	XML File	4 KB	
Sleeve .500 1.fb2	8/6/2020 4:03 PM	FB2 File	348 KB	
Sleeve .750.bmp	8/6/2020 4:04 PM	BMP File	601 KB	
Sleeve .750.vnc	8/6/2020 4:04 PM	GibbsCAM Part File	484 KB	
Sleeve .750_asy.xml	8/6/2020 4:04 PM	XML File	4 KB	
Sleeve .7501.fb2	8/6/2020 4:04 PM	FB2 File	357 KB	
Sleeve 1.0.bmp	8/6/2020 4:05 PM	BMP File	601 KB	
Sleeve 1.0.vnc	8/6/2020 4:05 PM	GibbsCAM Part File	689 KB	
Sleeve 1.0_asy.xml	8/6/2020 4:05 PM	XML File	4 KB	
Sleeve 1.01.fb2	8/6/2020 4:05 PM	FB2 File	754 KB	
Toolblocks.xml	8/7/2020 5:20 PM	XML File	11 KB	

Adding the toolblock library to the Machine data file

In order to use the toolblock library with our machine we have to open the Machine data file and add the library to it.

1. Go to File / Machine Data.

Intermediate Tooling - Machine Library		喧 平 - >	×
Tutorial Sample Lathe with Blocks	~	Edit	

2. Click Edit.

×

	Machine : Tutorial Sample Lathe with Blocks	🖻 ×
 Check the Libraries Toolblocks option for Tutorial2, our toolblock file. 	Toolgroup Data Toolgroup Number Use Toolblocks Toolgroup Type Turret Number Of Positions Uses Multi-Position Toolblocks Fixture Attachment Nodes Node Name Spindle Kiture Type Not Used Ubraries Toolblocks Tutorial2 Ubraries	Tool Position Configuration Tool Position Previous 1 Next Any Tooblock Type List Drill Boring Bar Cut Off Right Angle Iver Replace all Positions Prom This Tool Position 2 Insection Prom This Tool Position Paste To All Positions Copy This Data Paste To This Position Paste To All Positions Save Changes Cancel

Adding toolblocks to tools

We are now ready to add our new toolblocks to our tools.

- 1. Open file V14 Sample Intermediate Tooling Part.vnc. The part has eight tools and nine operations already defined.
- 2. Open Tool #1 (Lathe tool) and click the Tool setup button.



The Tool setup dialog appears, displaying all the toolblocks we set up earlier on in the tutorial.

Tool Setup Data		陸早-□×
Tool Offset Data (Inches)	Reset	Preview Toolgroup
O Specify Tool Offset X 2 Y 0 Z 1	Calculate Tool Offset H D Adjust Holder V D Z	 ₽ ₽
Root	Choose Toolblock Tutorial2 I.D Block Slight Turn Holder Tu Sleeve .375 Sleeve .1	

We will now add the Single turn block to this tool.

3. Simply click the block displayed in the toolblock section as shown above. The block appears in the setup dialog.

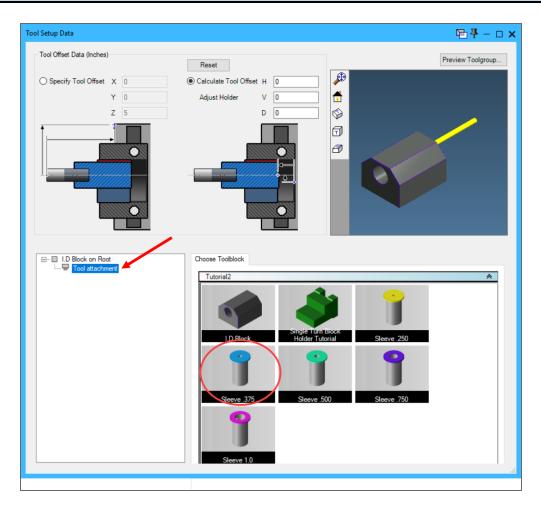
Tool Setup Data		□ →
Tool Offset Data (Inches)	Reset Calculate Tool Offset H Adjust Holder V D 2	Preview Toolgroup
Single Turn Block Holder Tutorial on Root Tool Attachment	Toolblock Data Name Single Turn Block Holder Tutorial Library Tutorial2 Types (unspecified) Fitting Type Any	Adjust Toolblock Orientation 1 Offset X 0 Offset Y 0 Offset Z 0

4. Close the tool dialog and open Tool #3 (Drill). Click the Tool Setup icon.

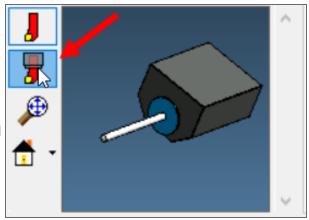


We will add a toolblock and sleeve to this tool.

- 5. Click the ID Block to add it.
- 6. Now click the Tool Attachment node as shown below and click the Blue sleeve (which is the correct size for this particular tool).



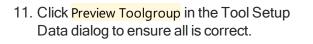
7. Close the Tool Setup Data dialog. Now look at the tool dialog. If you look at the tool pane at the bottom you will notice the Toolblock view icon. Click this to view the tool displayed within the toolblock. Close the tool dialog.



8. Close the tool dialog and open Tool #4 (Drill). Click the Tool Setup icon.



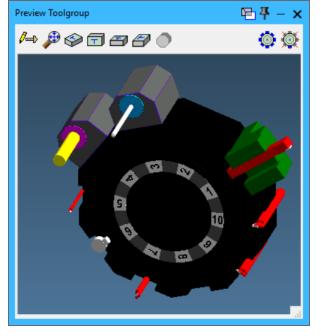
- 9. Click ID Block to add this to the tool.
- 10. Now click Tool attachment node in the tree display and then click the pink sleeve to add it to the ID Block. This is the correct size sleeve for this drill.



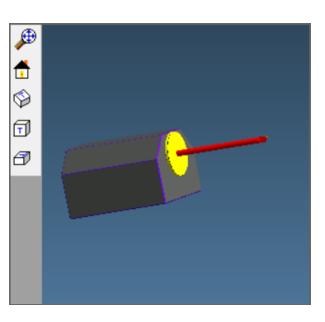
- 12. Close the Tool Setup Data dialog and the Tool dialog.
- 13. Open Lathe Tool #5 and click the Tool Setup button.

14. Add the ID Block to this, click Tool attachment, then the yellow sleeve. Your preview screen should look as shown.

- 15. Close Tool Setup dialog and Tool #5 dialog.
- 16. Open Tool #6, the broaching tool, and click the Tool Setup button.



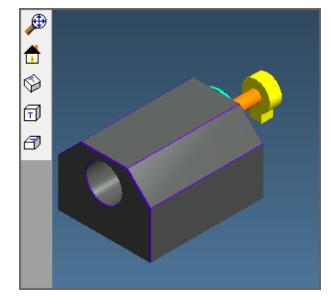


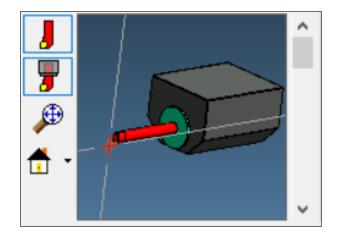


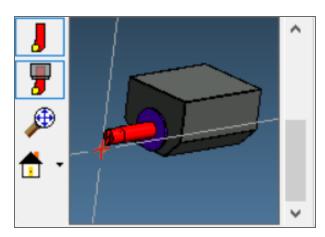


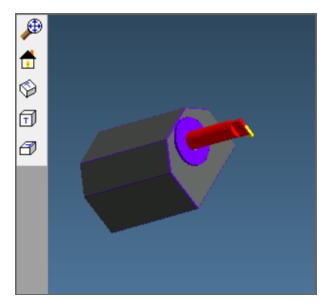
17. Add the ID Block to this, click Tool attachment, then the green sleeve. Your preview screen should look as shown.

- 18. Close Tool #6 dialog and open Tool #7.
- 19. Add an ID Block to this, then add the green Sleeve to it.
- 20. Close Tool #7 dialog and open Tool #9.
- 21. Add an ID Block to this, then add the purple Sleeve.
- 22. Close Tool #9 dialog and open Tool #10.



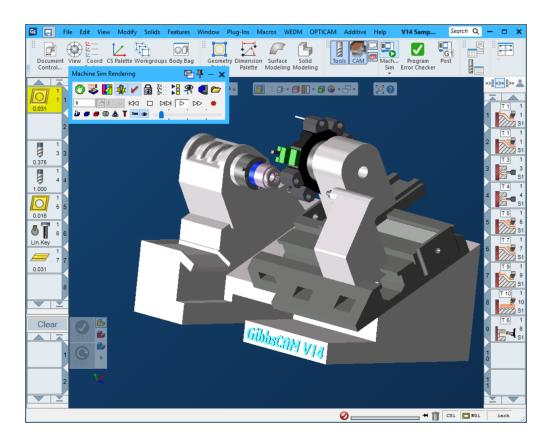






23. Add an ID Block to this, then add the purple Sleeve.

24. We have now set up all the toolblocks we require for this part. Go to Machine Simulation and run it.



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