# CadCamSystems
## Support Document

# Suggestions For "Rest Material Roughing"

Through many conversations with Delcam engineers and our own experience, we've gathered these tips for using Rest Roughing in PowerMILL. These suggestions should be used as a starting point for you to develop the best strategy for your application.

### General tips:

- Keep the model as clean and simple as possible. Delete duplicate surfaces and ensure surfaces are trimmed properly.

### Settings for Stock models:

- **Tolerances:** Set the tolerance to the lowest value you will use during "Stock model machining." A tolerance of .005 - .008 is reasonable. A "tighter" tolerance will give more accurate representation of the stock but will slow the process.
- **Step over:** It is equally important to apply a step over that is 50% of the smallest cutter you will use with the stock model. **Tighter than that and you will get better results but it will take longer to calculate.**
- In the proper order, apply **only** the toolpaths that you have used to cut your workpiece.
- After applying each toolpath, you must recalculate your stock model to achieve the current state of your stock condition.
- Use the option 'Detect material thicker than' under rest roughing to control what will be cut. Remember, you have a thickness on the toolpath already. If you have a thickness of .020 then you should use something greater than .030. The "Detect Material thicker than" needs to detect a significant amount of stock. The thickness of the previous toolpath does not apply, only the difference between the machining model and the stock model. Example: If you were going to leave .020 thickness then the "detect material thicker than" would need to be Thickness + tolerance of stock model + fudge factor = minimum "detect material thicker than" variable. A fudge factor of .008 works well in most instances.
- Check the box on the Offset Area Clearance form advanced tab "Allow tool Outside Block".
- Remember, you can use the "Show rest material" option on the stock model to visually show you what PowerMill will be looking at to cut.
- When you save the project, after viewing the stock model in shaded mode, PowerMill will save a file for the shaded stock model. This file can become very large and take a while to save. If you use the option "Remove triangulation" before you save, it will not save the large file.



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## Settings for Toolpaths:

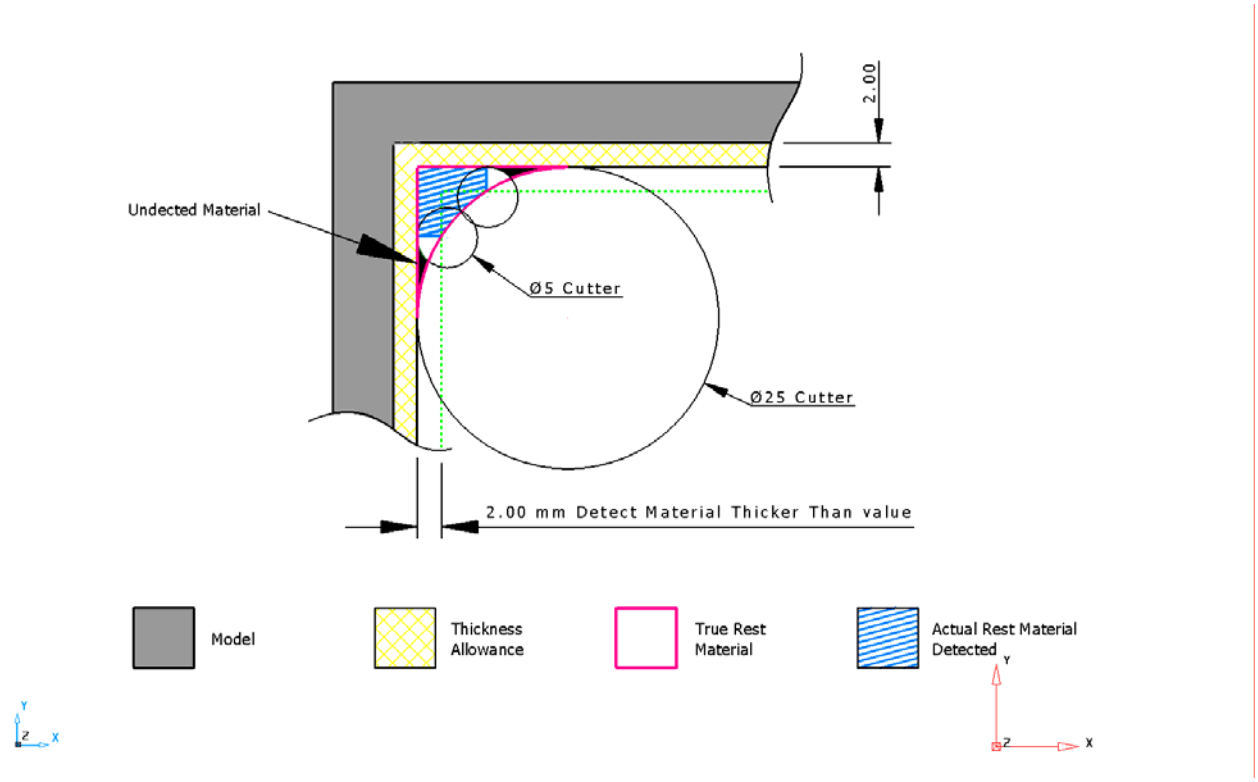
- The one main rule is the **radius** on the tool must be larger on the referenced toolpath. It also works best when the tolerance and the thickness do not change between toolpaths.
- Referencing a toolpath will give you a reliable toolpath but may tend to re-cut areas of the model already machined more often than stock model rest machining.
- The rules above also apply for use of the 'Detect material thicker than' option. Thickness + fudge factor = minimum "detect material thicker than" variable.

**Referencing a toolpath should be used when:**

- Speed is an issue (large models)
- The current cutters radius is <= to the previous cutter and the tip radius is <= to the previous tip radius
- No finishing toolpaths have been applied to the part
- No 3+2 toolpaths will be applied or the part is not being physically rotated or moved.

## Settings for both toolpath and stock model rest roughing:

- Set "type" to model.
- If the "detect material thicker than" value is used, "Expand area by" should also be used with the same value. Otherwise rest roughing may take a radial cut larger than expected.



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