Computer-aided Manufacture Guidelines

In order to have efficient cutting strategies, we need to consider the amount of material being removed against the tool life.

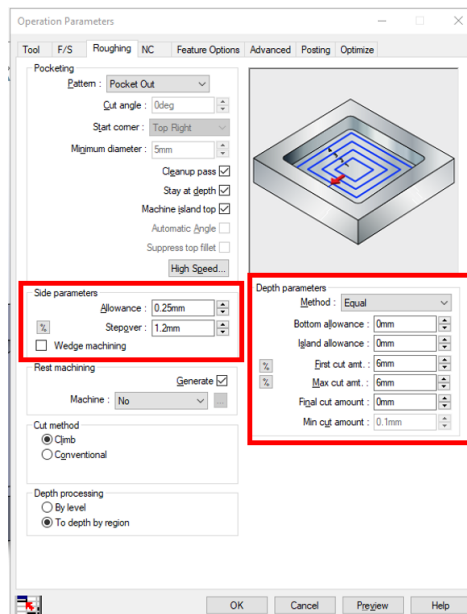A good rule that is used for endmills is as follows:

$$1.1 DOC\% \times WOC\% = 0.2 \tag{1}$$

where $DOC\%$ is the depth of cut and $WOC\%$ is the width of cut, both as a percentage of the tool diameter. What this means is the deeper your depth of cut, the shallower your width of cut needs to be and vice versa.

FAILURE TO FOLLOW THE ENDMILL CUTTING RULE WILL MOST LIKELY RESULT IN THE CUTTER BREAKING!!

For example, let's consider our 6mm endmill. If our DOC is two times the tool diameter (12 mm), then we can only have a WOC that is 9.1% the tool diameter (0.55 mm).

Importantly, we must always manually adjust our WOC or DOC in each operation. The relevant parameters can be found in the "Roughing" tab and is known as "Stepover" for WOC. The Depth parameters can also be adjusted.

Proposed Order of Operations

As you may recall from the lectures, we always start with a roughing operation to remove large amounts of material, then move to finishing operations to get appropriate dimensional compliance. Finally, we implement operations for various features. A typical order for CAM operations would be:

1. Facing
2. Roughing
3. Finishing
4. Features E.g. Chamfers, drilled/tapped holes