Insight

Objectives

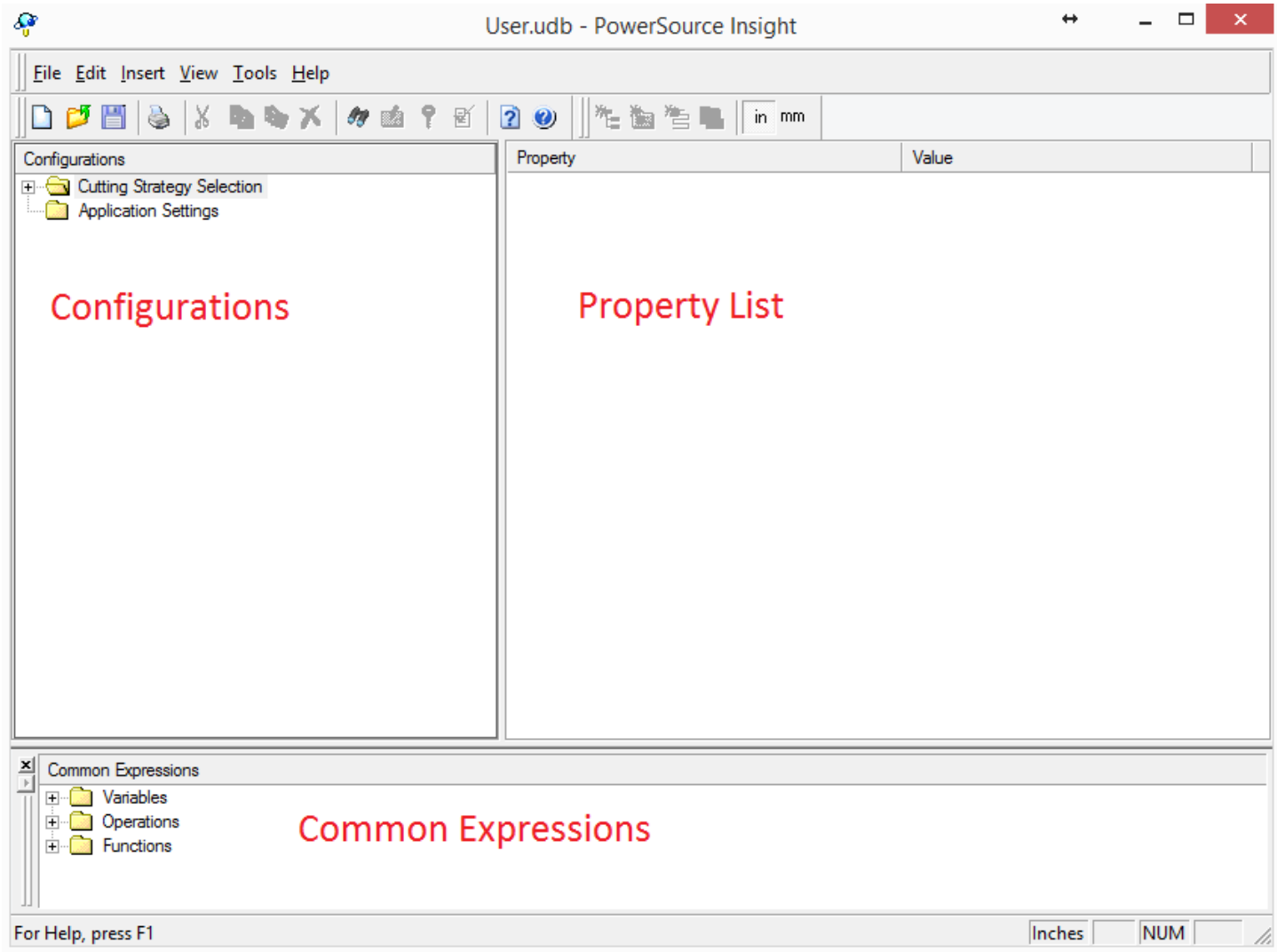
Learn to navigate Insight's user interface. Learn about different types of Properties and Rules.

Overview

Insight User Interface
Property Types
Types of Rules
Special Properties
Copy/Paste

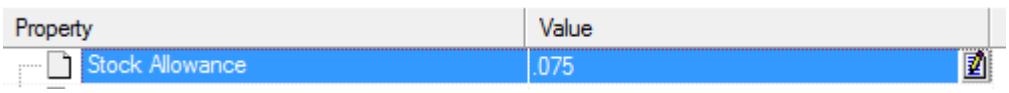
Insight User Interface

Standard Windows Interface - Menu, Toolbars, etc. The application has 3 Panes – Configurations on the left, Properties List on the right, and Common Expressions at the bottom. The Configurations tree has two folder – Cutting Strategy Selection which contains all the Materials, Configurations, and Rules for Properties, and Application Settings which contains some global Properties. What's This Help is very useful, especially when making Rules for Properties. When you start Insight, it automatically loads the User database used by Prospector:

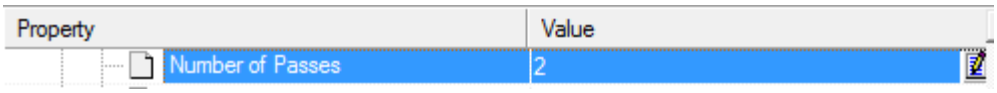


Property types

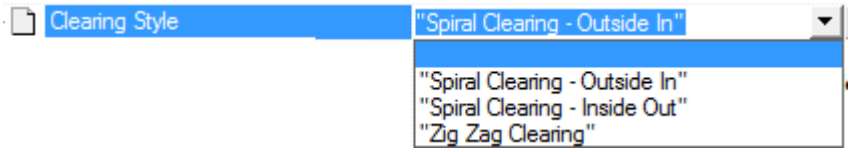
There are three types of Properties: Numbers, Lists, and Strings. Numbers can be a floating-point number, such as Stock Allowance:



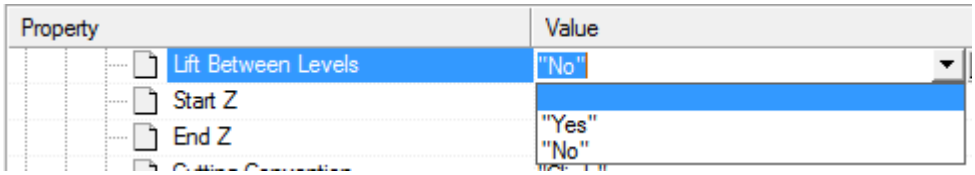
Or an integer, such as Number of Passes:



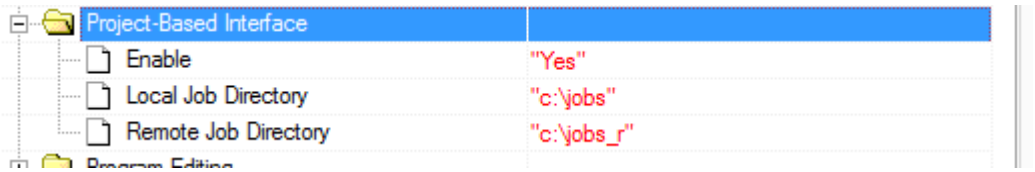
Lists are Properties like Clearing Style, which can be one of three values, Spiral Outside-In, Spiral Inside-Out, or Zigzag Clearing. In Insight, List Properties have a drop-down list where you can select one of the values:



A special type of List is known as a Boolean, which has a value of Yes or No, such as Lift Between Levels:

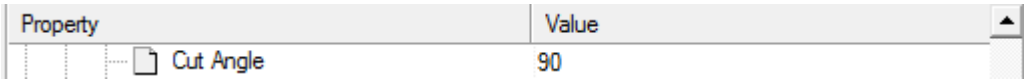


The last type of Property is a String, which is a series of letters and/or numbers, such as the Local Job Directory:

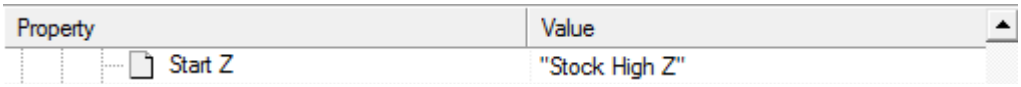


Strings have to be enclosed in double quotes. Not many Properties are Strings, especially when we get into the Cutting Strategies.

Types of Rules
There are two types of Rules, Simple Rules and Conditional Rules. In this lesson, we'll only go over Simple Rules. Conditional Rules is another lesson. Simple Rules can just be hard-coded values, like we saw in the introductory video, such as using 90 degrees for the Cut Angle:

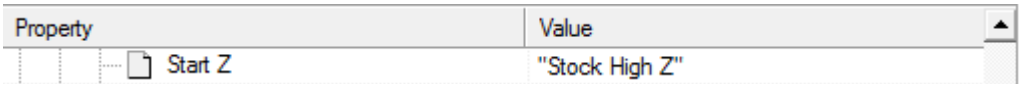


These Rules can just be typed into the Value cell of the corresponding Property. Simple Rules can also be Expressions or Equations, which are usually dependent on another Property, such as Start Z, which is set to the highest stock Z in the Window:

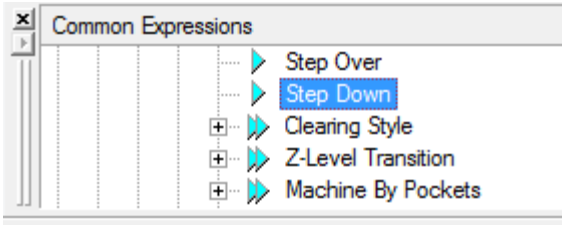


The Common Expressions pane contains all the Properties available to make Rules. When you override a rule in the User database, it shows up in red. Rules in black are from the System database. To revert an overridden Rule, simply click in the Value cell, delete the Rule, and hit Enter. The Rule will revert to the Rule from the System database. Let's take a look at some examples of Simple Rule

Example 1 - The first level for Z-Planar With Clear is always at the highest stock value, I want to start one level lower.
In Insight, go to Inch/P20/Plastic Injection Mold/Basic Machining/Rough/3D Strategies/Z-Planar With Clear. The rule is "Stock High Z":



But I want to start one level lower. How would I do that? I need to subtract the Step Down from the Stock High Z. Click in the Value cell for Start Z-Planar and then click at the end. Type a space, a minus sign (-), and another space. Now go to the Common Expressions pane and open the Variables/Cutting Strategy Selection/3D Strategies/Z-Planar With Clear Strategy. Double-click on "Step Down":



Hit Enter key to save the Rule. Now our Rule is "Stock High Z" - "Z-Planar With Clear, Step Down":

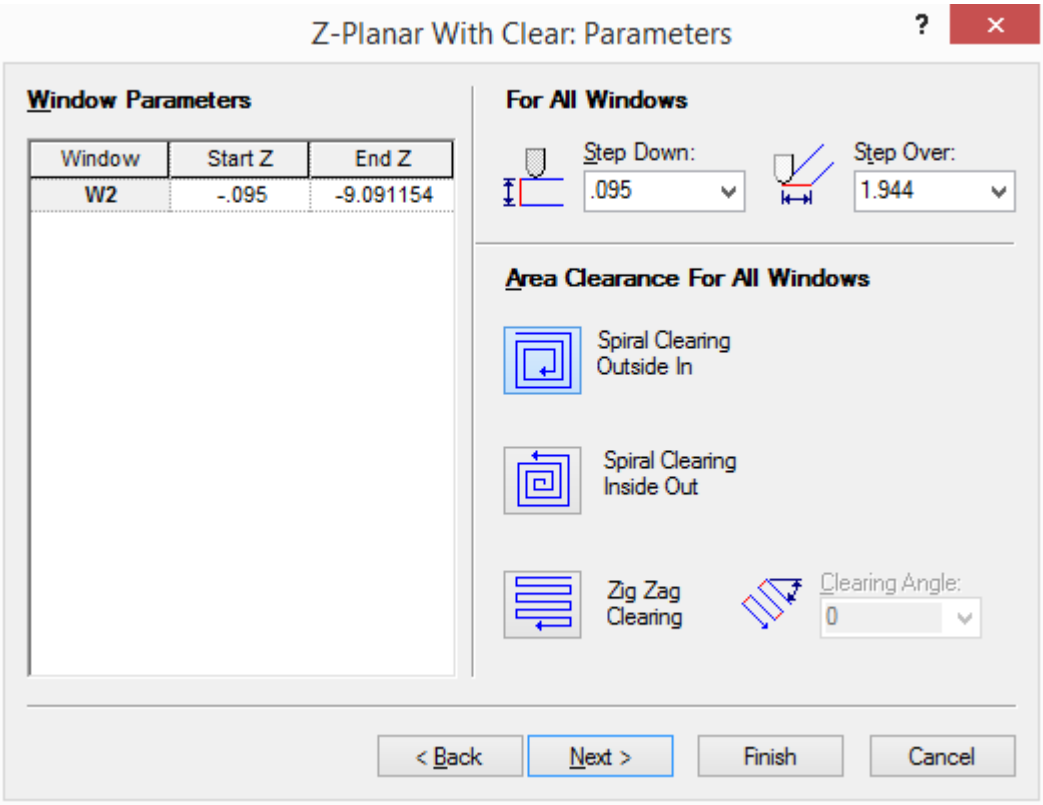
Property	Value
Start Z	"Stock High Z" - "Z-Planar With Clear,Step Down"

When working in Insight, make sure of:

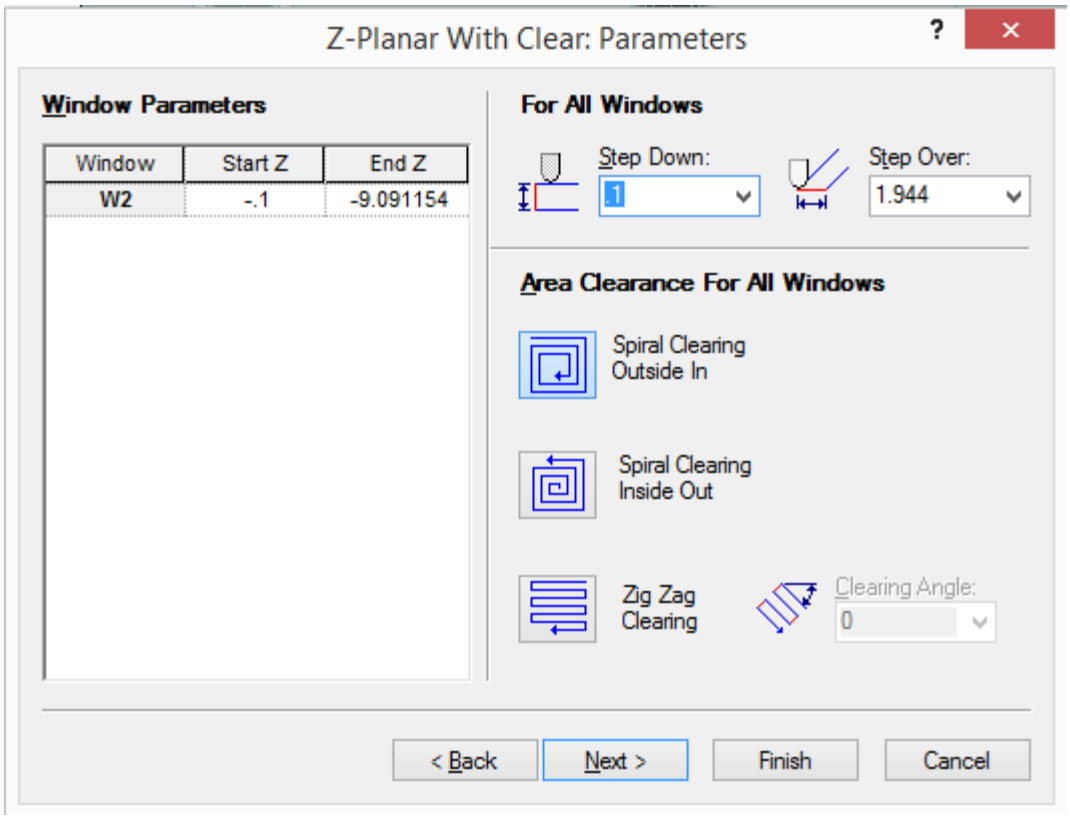
- Units, Material, Configuration, and Category (Rough, Semi Rough, etc)
- Property in Property List
- Strategy in Common Expressions Pane

Save the Database and let's test the Rule in Prospector.

Prospector
In Rough Category, new 3D Program, Window Around Part, Z-Planar With Clear, and Next your way to the Parameters page. Instead of starting at Z 0, the Program will start at Z -0.95, which corresponds to the Step Down:

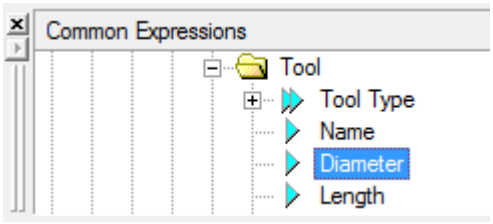


Since the Rule is dependent on Step Down, if we change the Step Down, the Start Z will also change. Rules dependent on other Properties will get re-executed if those Properties change. Let's change the Step Down to .1. The Start Z changes to -.1:

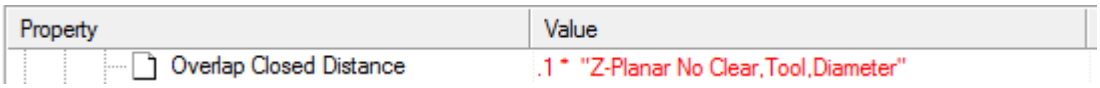


The Start Z Rule is also dependent on the High Stock Z in the Window, but since we cannot change this value in the wizard, it only comes into play when we create the Window. Rules only get executed when creating a new Program, not when you use Update or Properties to change an existing Program. Let's take a look at another example. Head back to Insight.

Example 2 - The Overlap Closed Distance is 0, I want it to be 1/10th of the tool diameter
Go to Inch/P20/Plastic Injection Mold/Basic Machining/Semi Rough/3D Strategies/Z-Planar No Clear. The Rule is "Z-Planar No Clear,Tool Setup,Overlap Closed Distance" is 0. Click in the cell and I can just start typing to overwrite it. Type .1, space, times sign (*), and another space. In the Common Expressions pane, go to Variables/Cutting Strategies/3D Strategies/Z-Planar No Clear/Tool and double-click on Diameter:

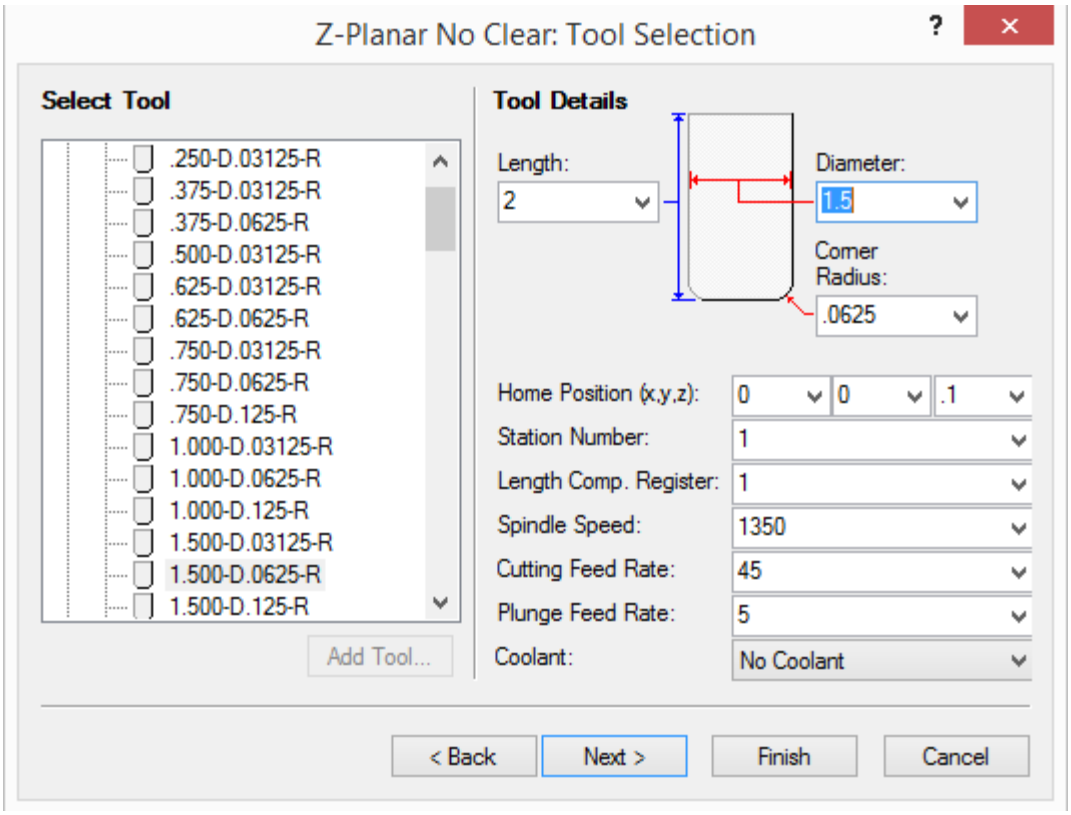


Hit the Enter key to save the Rule to the Database:

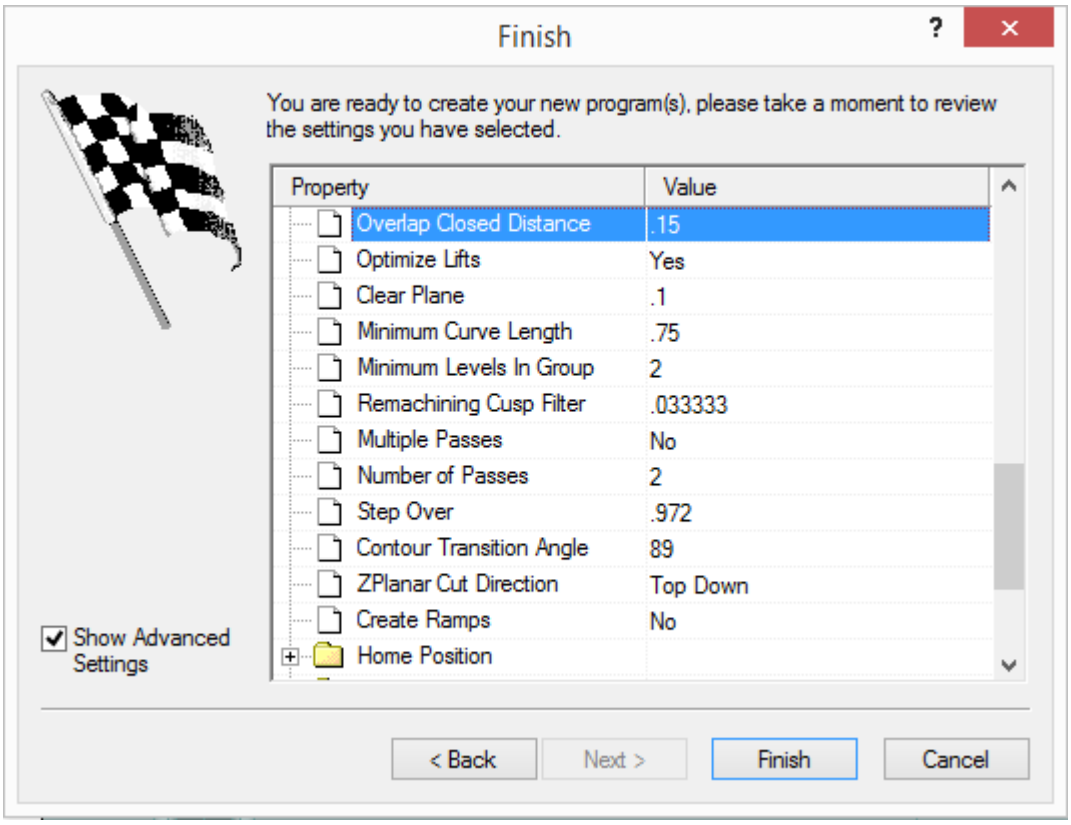


Time to check the Rule in Prospector. Remember to save the Database!

Prospector
In Semi Rough Category, new 3D Program, Window Around Part, Z-Planar No Clear, and Next to the Tool page. Make sure to note the Diameter of the Tool, in this case it's 1.5 inches:



Now next your way to the last page. Notice Overlap Closed Distance value is .15, 1/10th of the Tool diameter:

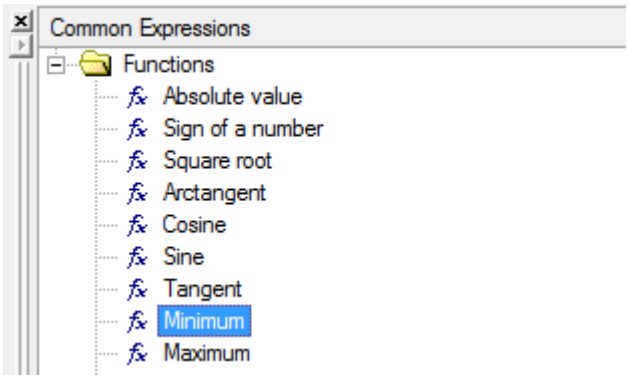


Cancel out of the wizard and let's take a look at one more example. Back to Insight.

Example 3 - The fast feed rate for Z-Planar No Clear is the same as the cutting feed rate, I want to double it. But I don't want it to be over 100 IPM

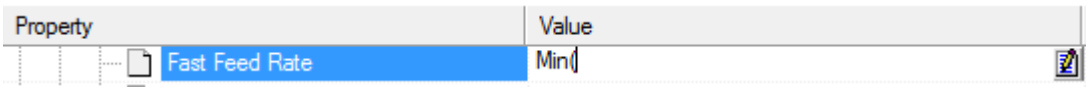
Go to Inch/P20/Plastic Injection Mold/Basic Machining/Semi Finish/3D Strategies/Z-Planar No Clear. The Rule is "Z-Planar No Clear,Tool Setup,Cutting Feed Rate" which is just the Cutting Feed Rate. Let's just clear the Rule for now. Click in the Rule cell. Hit

the Backspace key to clear it. Now go down to the Common Expressions pane, and find the Functions node. These general functions you can use, such has Trig - sine, cosine, and many others. In this case, I want to use the Minimum function, to limit the Fast Feed Rate to 100 IPM. Double-click on Minimum:

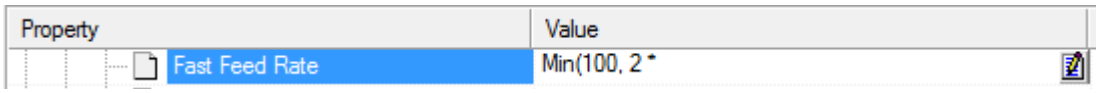


This adds "Min(Value1, Value2)" to the cell:

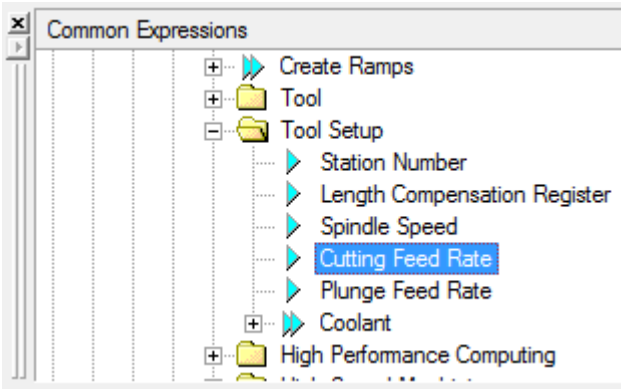
We need to enter two values, first backspace to the open parenthesis:



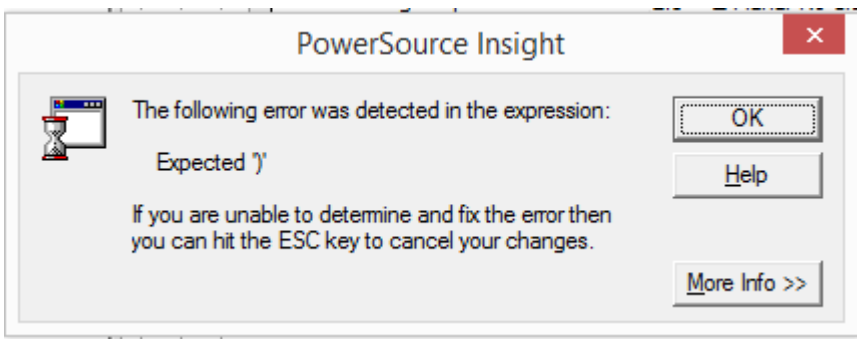
Now type, 100 (the first value), a comma, and a space, then type 2, and the times sign (*), and another space:



Now go to the Common Expressions pane and find Variables/Cutting Strategy Selection/3D Strategies/Z-Planar No Clear/Tool Setup. Double-click on "Cutting Feed Rate":



Hit Enter to save the Rule:



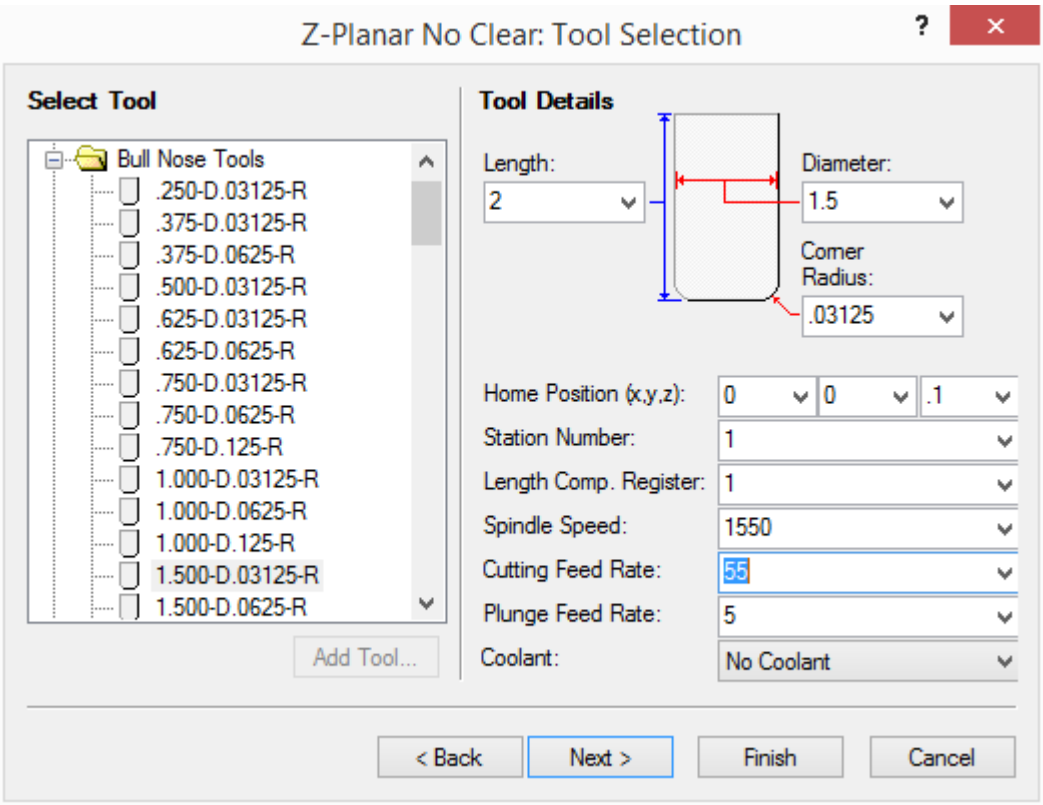
Oops, Insight does some syntax error checking. We forgot to add then end parenthesis. Click OK to dismiss the error message. A

future lesson will go into more details about trouble-shooting Rules. Type in the end parenthesis and hit Enter:

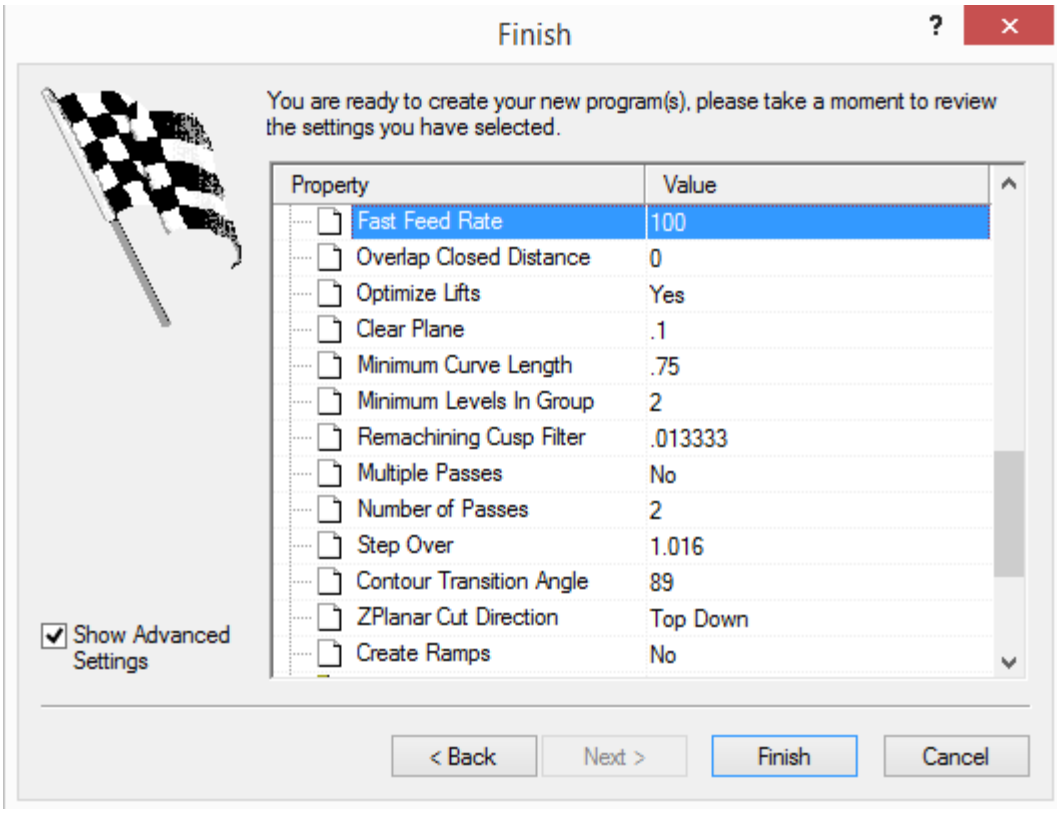
Property	Value
Fast Feed Rate	Min(100, 2 * "Z-Planar No Clear,Tool Setup,Cutting Feed Rate")

Good. Time to check the Rule in Prospector. Save the Database and head back to Prospector.

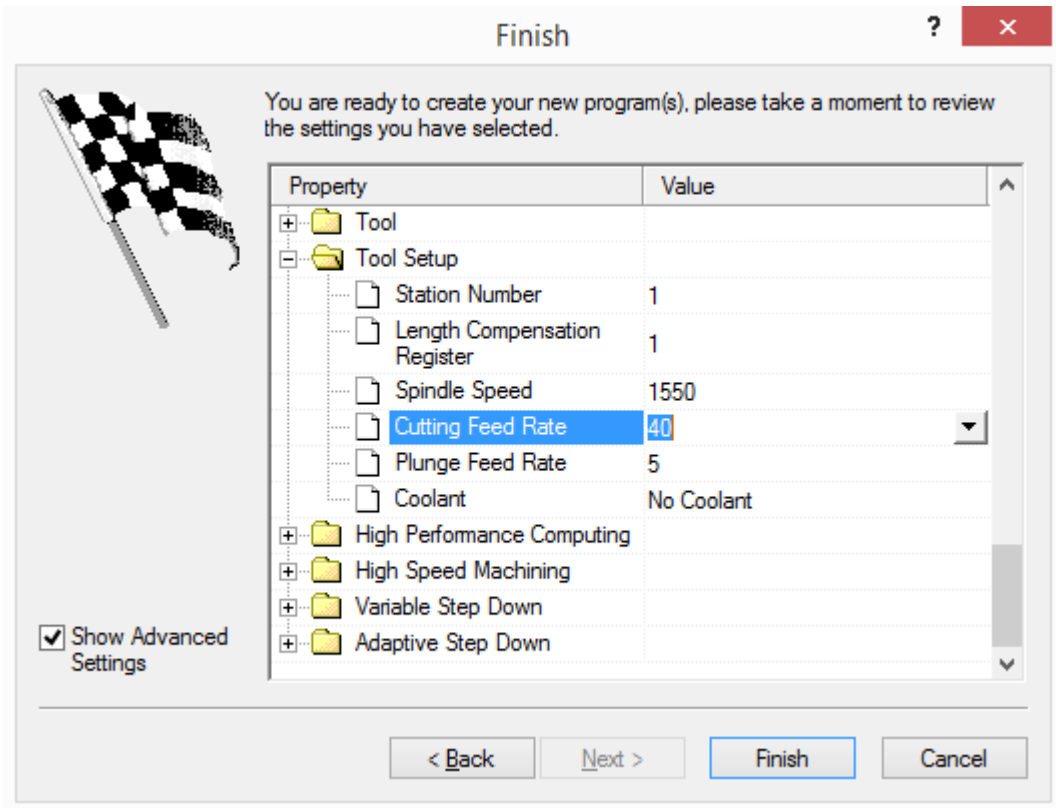
Prospector
In Semi Finish Category, new 3D Program, Window Around Part, Z-Planar No Clear, and on the Tool page, make note of the Cutting Feed Rate, which, in this case, is 55:



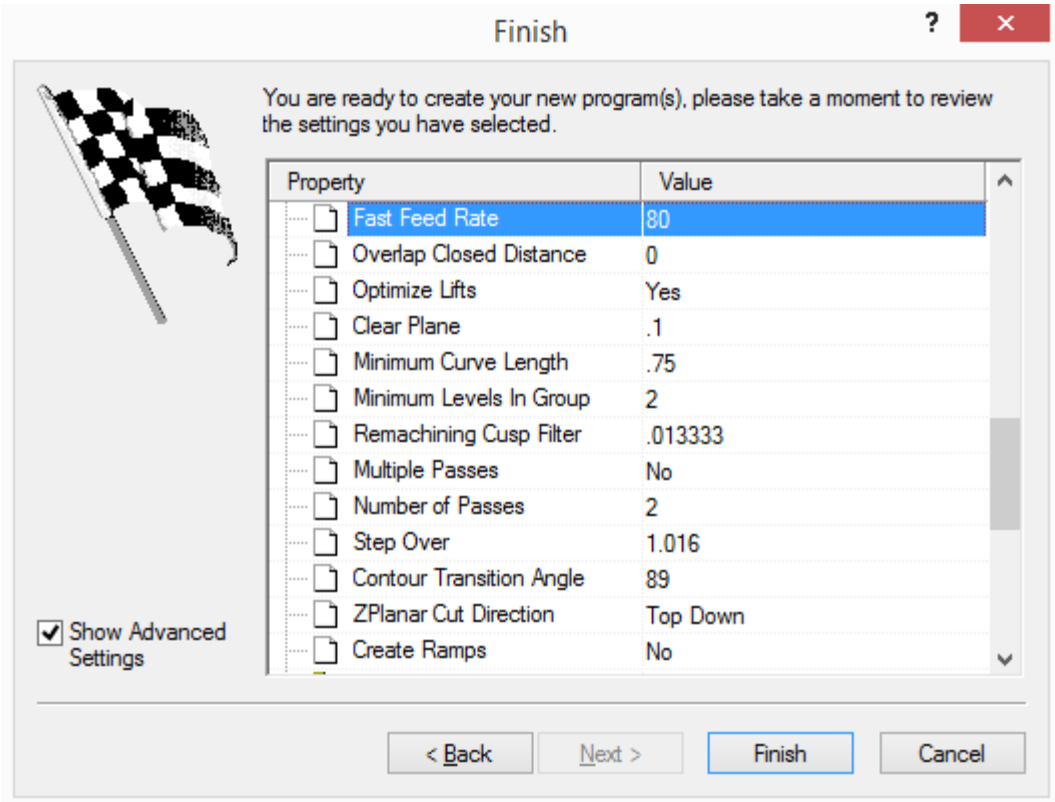
Now Next your way to last page. Notice Fast Feed Rate:



Doubling the Cutting Feed Rate would result in 110, but we limited the value to 100. Let's go down to the Tool Setup information and change Cutting Feed Rate to 40:



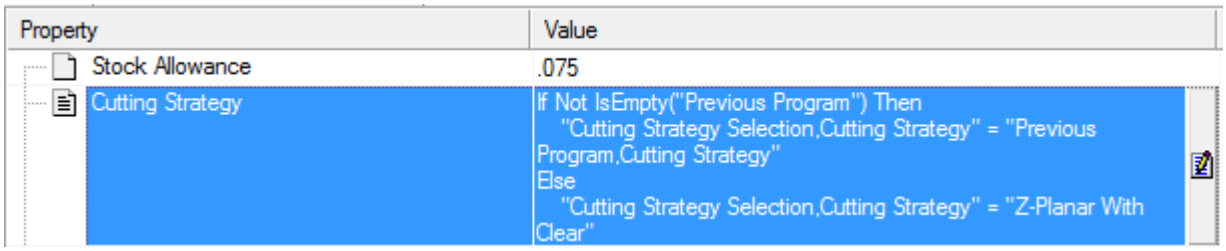
Now scroll back up to the Fast Feed Rate, which is now 80, double the value of the Cutting Feed Rate:



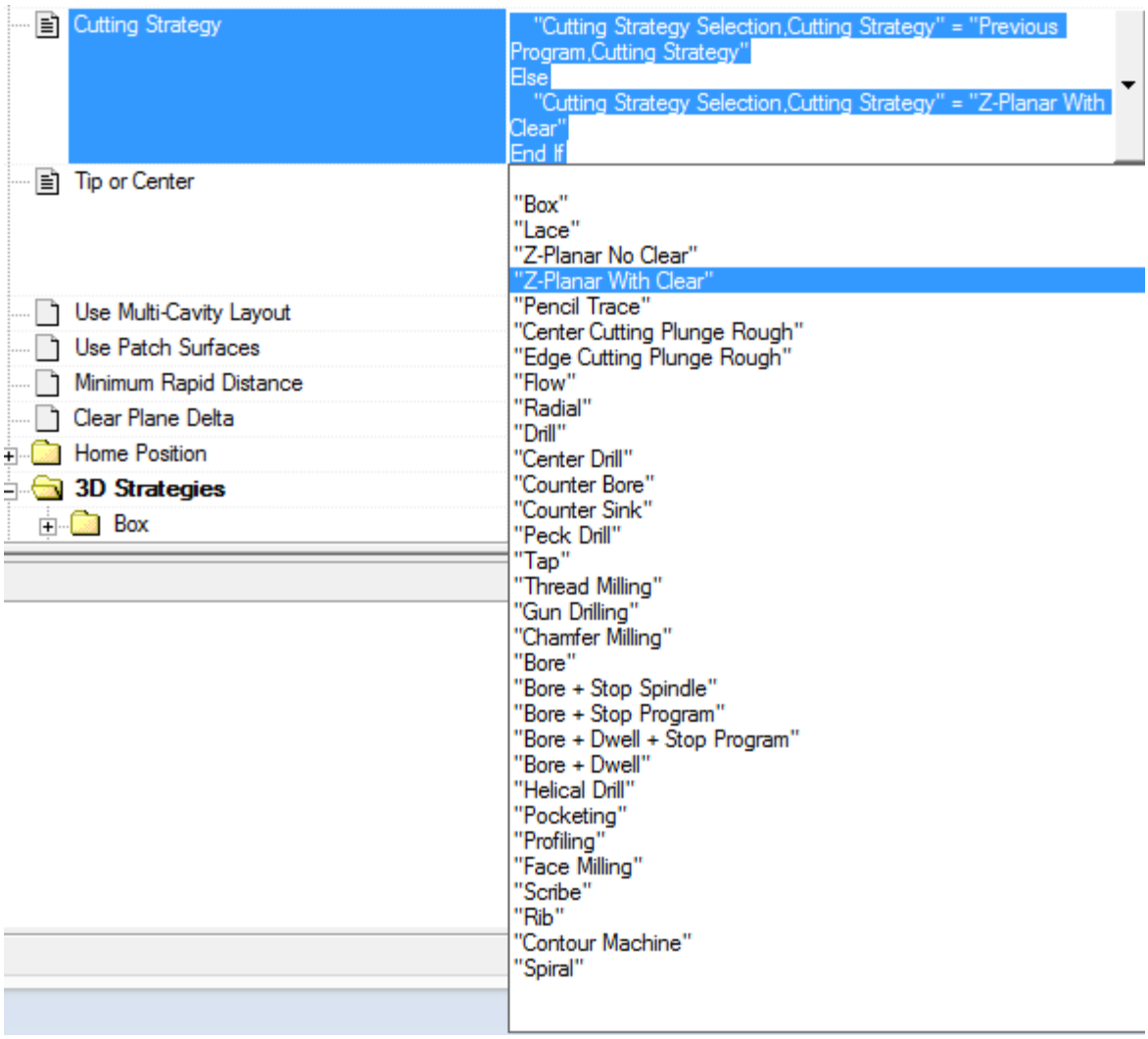
Again, it re-ran the Rule because it's dependent on the Cutting Feed Rate. Let's take a look at a couple of special Properties.

Special Properties

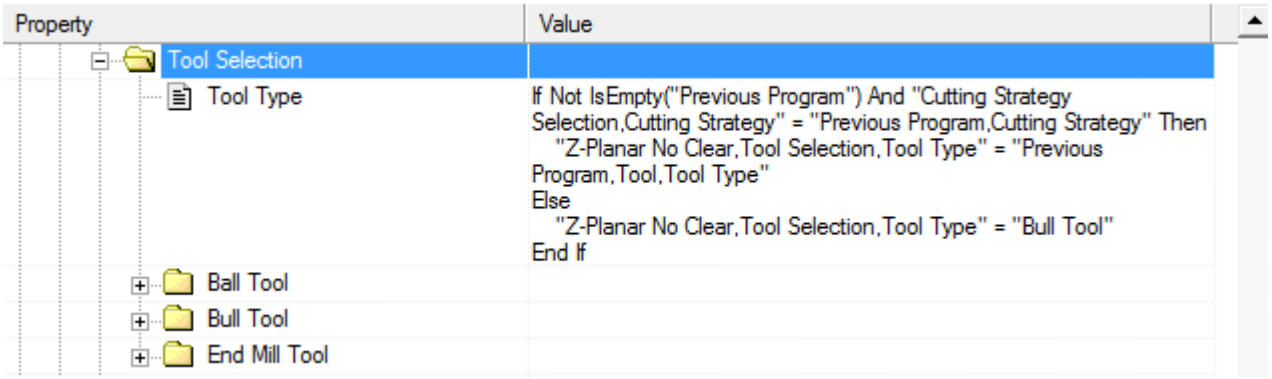
Cutting Strategy and Tool Selection are special Properties that are used to select the Cutting Strategy and Tool for the Program. They don't appear on the last page of the wizard. The Cutting Strategy Property is found near the top:



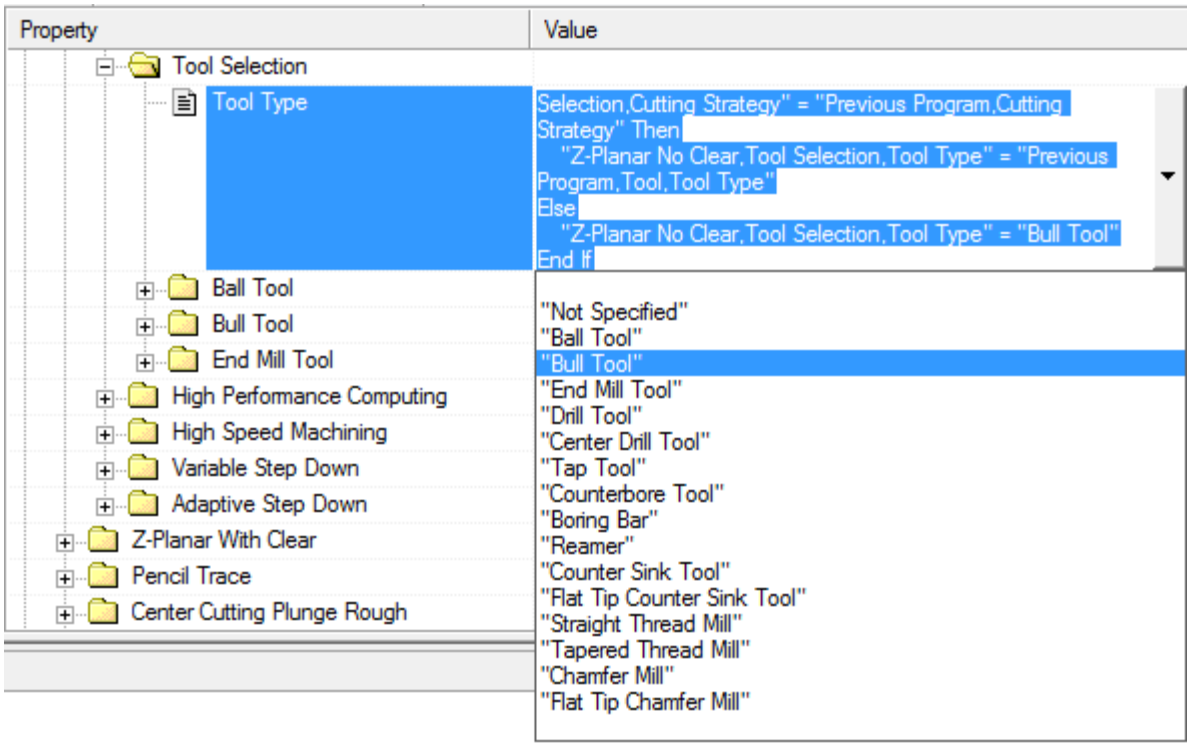
This is a list Property where the drop-down contains a list of all the Strategies available in Prospector:



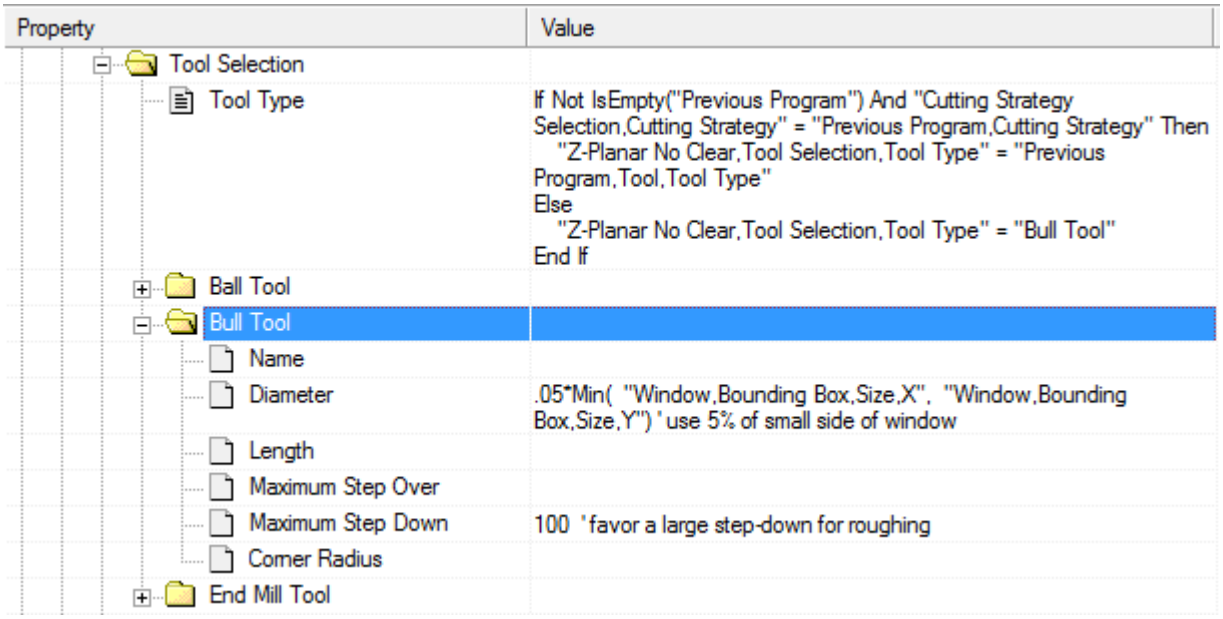
The default Rule is a Conditional that basically says if there is a previous Program in the Category, select the Strategy of the previous Program, otherwise, for Rough, select Z-Planar With Clear. The other Special Property tells Prospector which Tool to Select. There's actually several Properties associated with Tool Selection, depending on the Strategy and Tool Type. For example, in Z-Planar With Clear:



First is the Tool Type, which is a list Property that contains a list of all the supported Tool Types:



Once PowerSource determines the Tool Type, it looks to the specific Tool Type Properties to select the Tool. For Bull Tools:



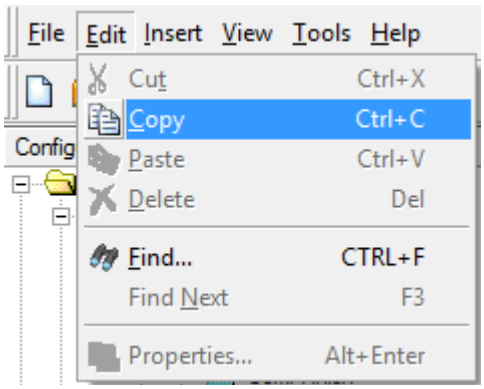
Notice that some of Properties don't have values! These are the only Properties that can be left blank. All other Properties must have a Rule. PowerSource uses these Properties to pick the best Tool from the list of Tools. In this case, only the Diameter and Maximum Step Down help determine the Tool to pick.

Copy / Paste

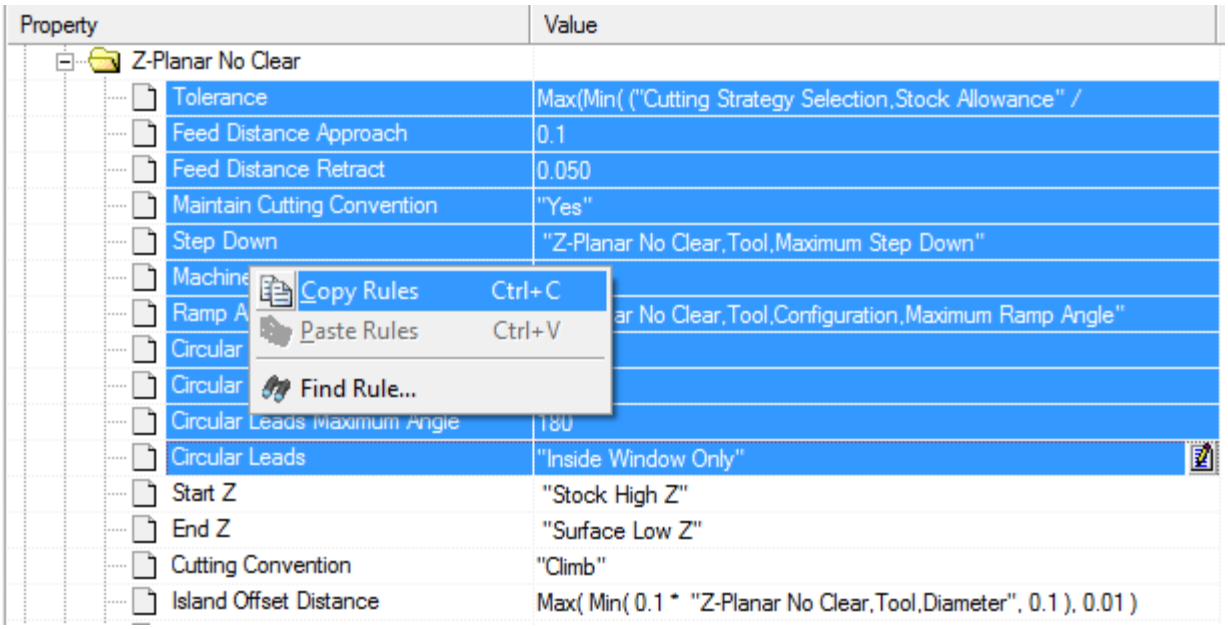
You must have at least one Rule selected to Copy/Paste. There are several ways to select Rules. You can click on the Property name to select the Rule and shift-click on another Property name to select all the Rules in between and included the Rules:

Ctrl-click will toggle the selection of a Rule:

There are several ways to Copy/Paste Rules. You can use the Edit menu - Copy/Paste:

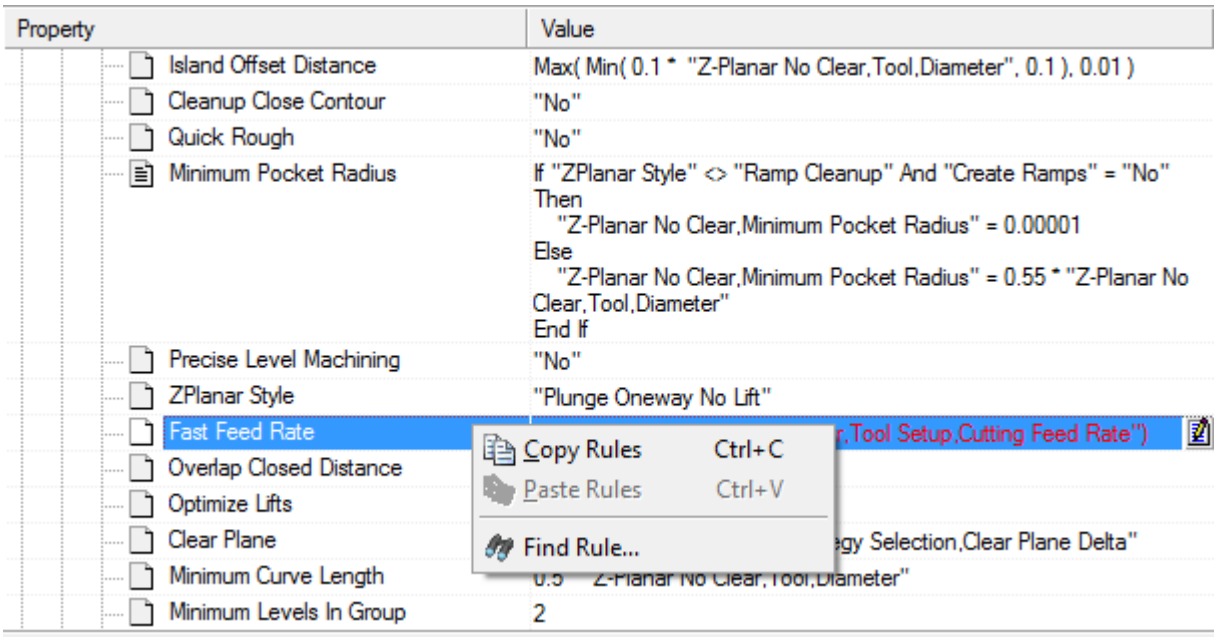


Or you can right-click on the Properties and use Copy/Paste Rules:

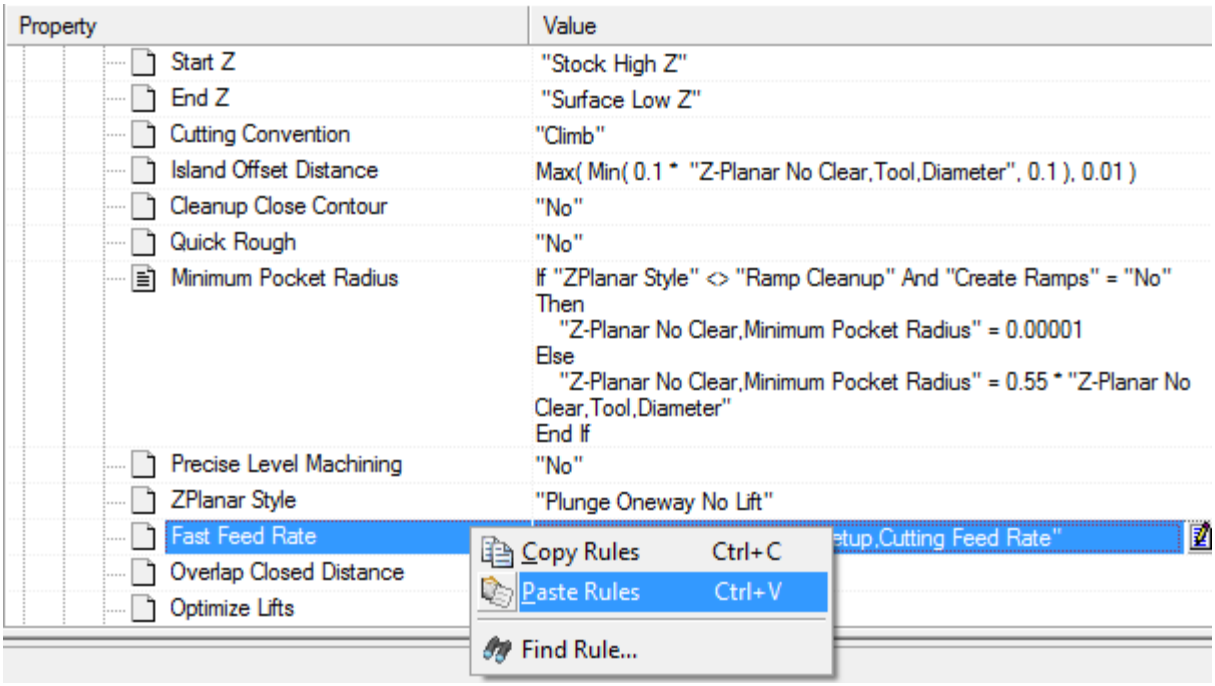


Lastly, you can use Standard Windows Copy/Paste keys - Ctrl-C to Copy, Ctrl-V to paste.

Example - Let's copy the Fast Feed Rate rule we just made to the Finish Category
Go to Inch/P20/Plastic Injection Mold/Basic Machining/Semi Finish/3D Strategies/Z-Planar No Clear. Click on "Fast Feed Rate" to select the Rule. Right-click and select Copy Rules:



Click on the Finish Category. Notice that it takes you right to the same Rule. Click on "Fast Feed Rate" to select the Rule Right-click and select Paste Rules:



Summary

- Every Property has a Rule
- Rules are grouped by:
  - Units
  - Material
  - Configuration
  - Category
- Rules can be Simple or Conditional
- Rules can include equations
- Use the Common Expressions pane to access other Properties to use when making Rules
- Double-click on a variable in the Common Expressions pane to add it to the Rule
- To revert a Rule back to the System database, select it and delete it
- Use Copy/Paste to copy Rules to other Categories
- Always test your Rules
- Run Prospector and Insight
- They both can access the database at the same time
- Prospector knows when the database changes and reloads the new Rules
- Make sure to cancel out of the Program wizard before testing a new Rule