

Introduction To PowerSource

Objectives

A quick introduction to PowerSource.

Overview

Example of PowerSource in action

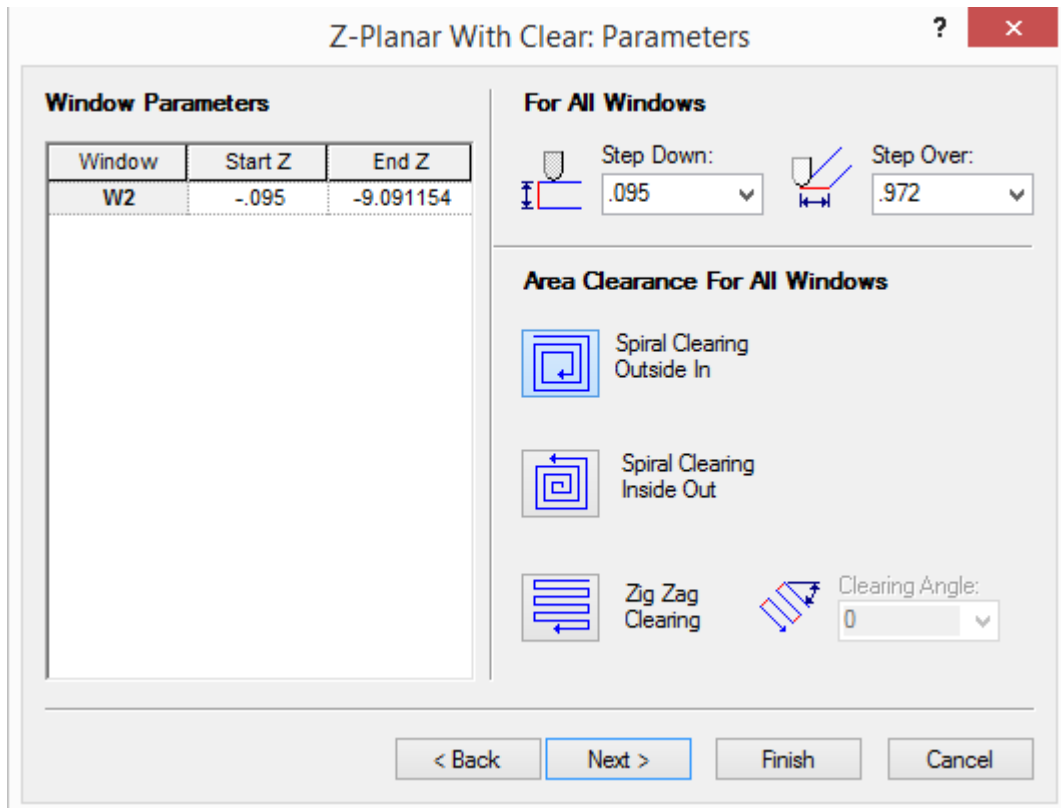
What is PowerSource

Organization in Insight

Quick and easy examples of working with Prospector and PowerSource Insight

Example of PowerSource in action

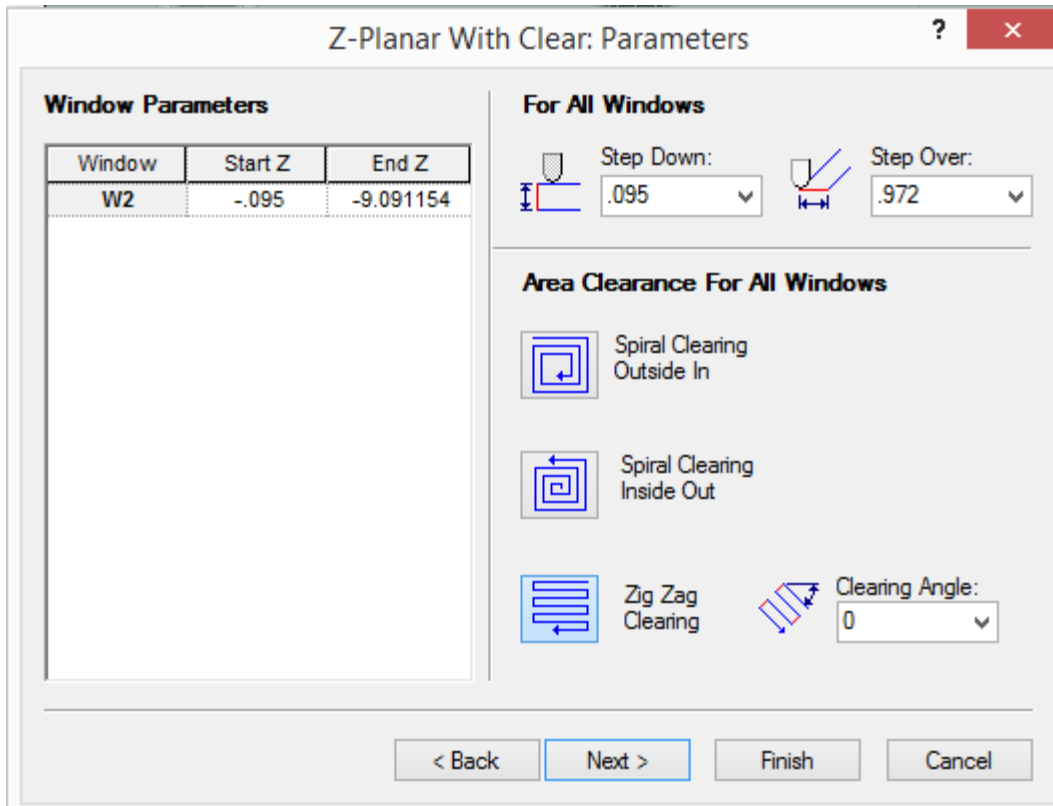
Start Prospector and open the sample Project. In Rough Category, start new 3D program wizard, Window Around Part, Z-Planar With Clear, Next to the Parameters page. The default Clearing Style is Spiral Clearing, I prefer Zigzag:



Now, I can always go to this page and change the Clearing Style every time I create a Z-Planar With Clear program. But instead, I can change the Rule for Clearing Style. Cancel out of the wizard and start Insight. Go to Inch/P20/Plastic Injection Mold/Basic Machining/Rough/3D Strategies/Z-Planar With Clear. Change the Clearing Style to Zigzag:



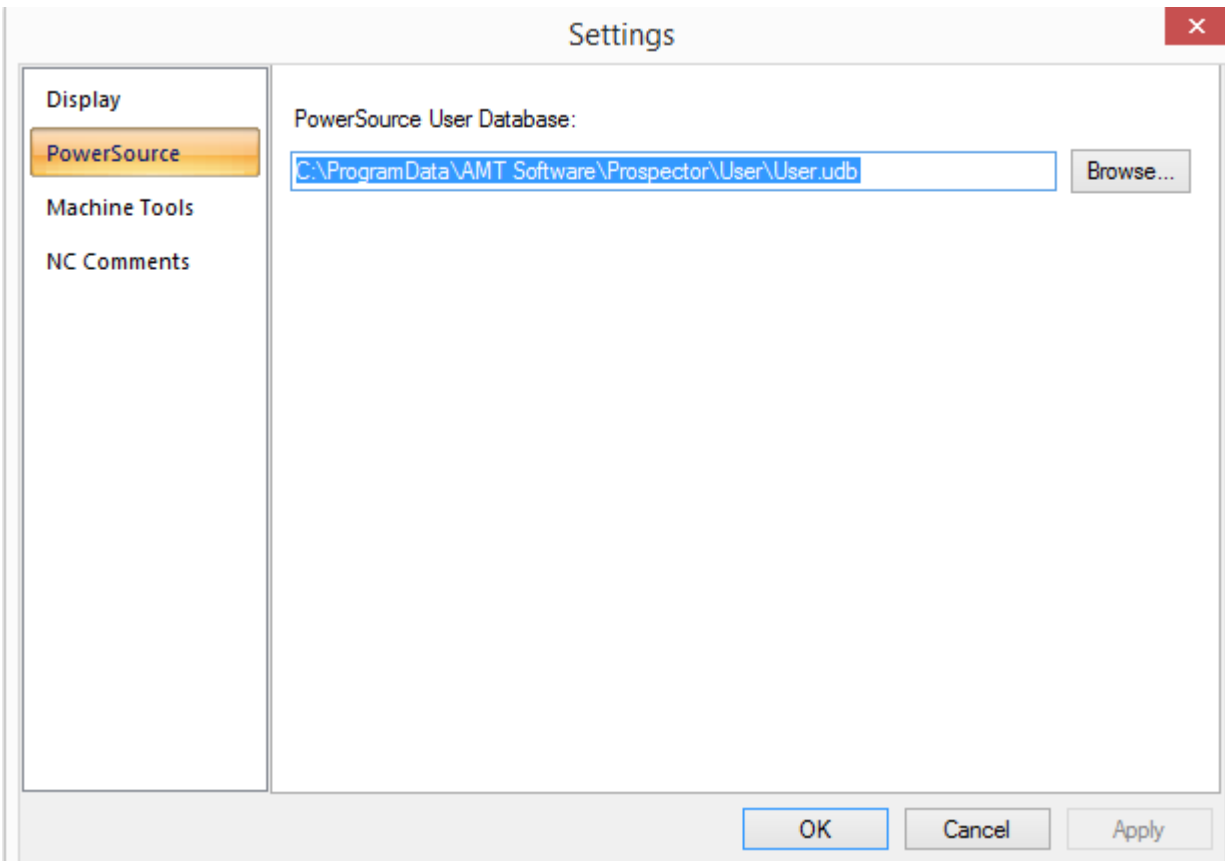
Save the Database and return to Prospector. In Rough Category, start new 3D program wizard, Window Around Part, Z-Planar With Clear Next to the Parameters page. Notice it now picked Zigzag Clearing:



Cancel out of the wizard. What just happened?!? PowerSource!

What is PowerSource

PowerSource is the engine behind Prospector. Prospector is in constant contact with PowerSource. Rules are executed at runtime. Prospector provides PowerSource with information, such as Window information, and PowerSource provides Prospector with Properties. Databases contain user-defined rules for every Property of every Strategy. Prospector references a User database - Tools/Settings/PowerSource page:



Every User database has a corresponding System database. User database overrides rules based on user preferences. A System database may have any number of User databases.

Organization in Insight

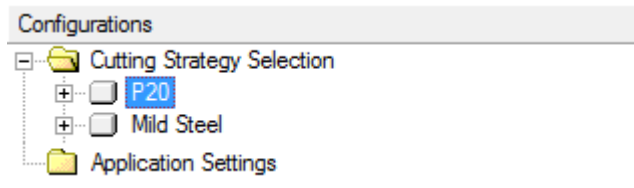
In Insight, the PowerSource Rules are organized in the tree control on the right. But the top most level is the Units which are found in the Toolbar:



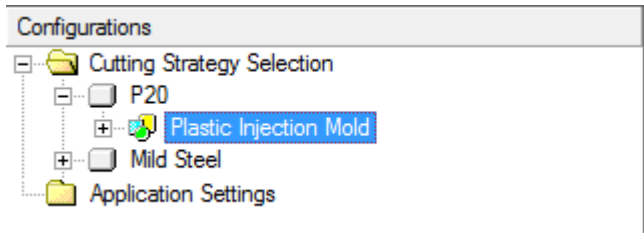
Clicking on one or the other will switch between Inches and MM. The active Units also appear in the Status Bar:



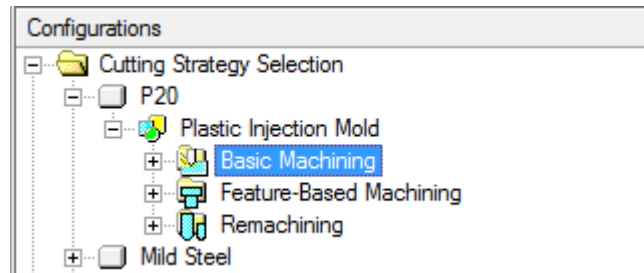
The units are associated with the Project. Most shops just use one. Stay in that one. In the Configurations pane on the left, go to the Cutting Strategy Selection (ignore Application Settings for now). This contains the list of Materials available in the Database. Like the Units, the Material is associated with the Project:



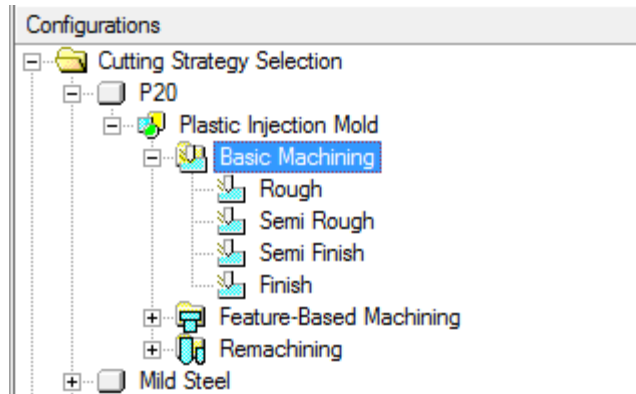
This is where the new Project wizard gets its list of Materials. The Database can contain any number of Materials. Materials must be created in the System Database. We'll go over that in another lesson. Under each Material is a list of Configurations:



This is where the new Project/Setup wizards get the list of Configurations. Configurations are associated with Setups. Materials can have any number of Configurations. A Configuration is associated with a Setup. Each Configuration will have 3 nodes – Basic Machining, Feature-Based Machining, and Remachining:



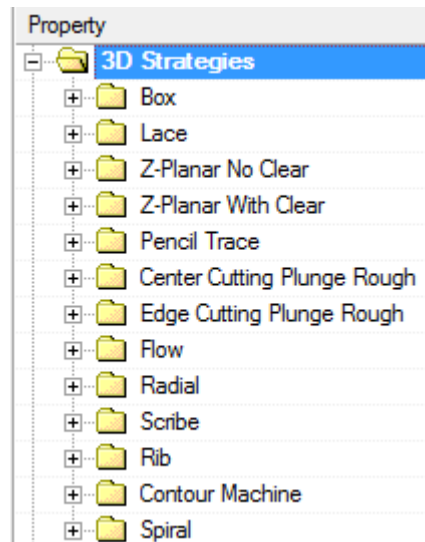
We'll look at Basic Machining (ignore Feature-Based and Remachining for now, those will be covered in future lessons). Basic Machining contains the four Categories - Rough, Semi Rough, Semi Finish, Finish, just like in Prospector:



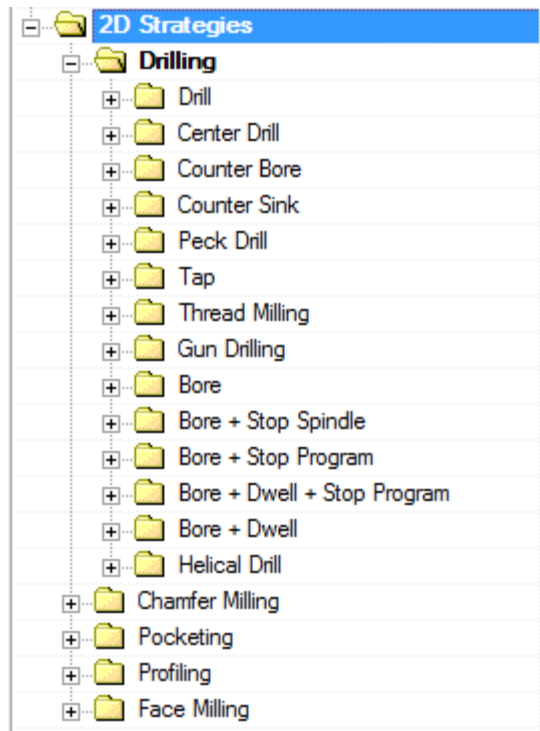
You cannot add or remove Categories. Clicking on the Rough Category brings up the Rules for the Rough Category:

Property	Value
Stock Allowance	.075
Cutting Strategy	If Not IsEmpty("Previous Program") Then "Cutting Strategy Selection,Cutting Strategy" = "Previous Program,Cutting Strategy" Else "Cutting Strategy Selection,Cutting Strategy" = "Z-Planar With Clear" End If
Tip or Center	If "Is Default WorkSpace" = "Yes" Then "Cutting Strategy Selection,Tip or Center" = "Tip of Tool" Else "Cutting Strategy Selection,Tip or Center" = "Center of Radius" End If
Use Multi-Cavity Layout	"Previous Program,Use Multi-Cavity Layout"
Use Patch Surfaces	"Previous Program,Use Patch Surfaces"
Minimum Rapid Distance	0.125
Clear Plane Delta	0.1
Home Position	
3D Strategies	
2D Strategies	

At the top, we have Common Properties associated with all Strategies (Stock Allowance, Tip/Center, Home Position, etc). Below is the list of 3D Strategies:



And the list of 2D Strategies:



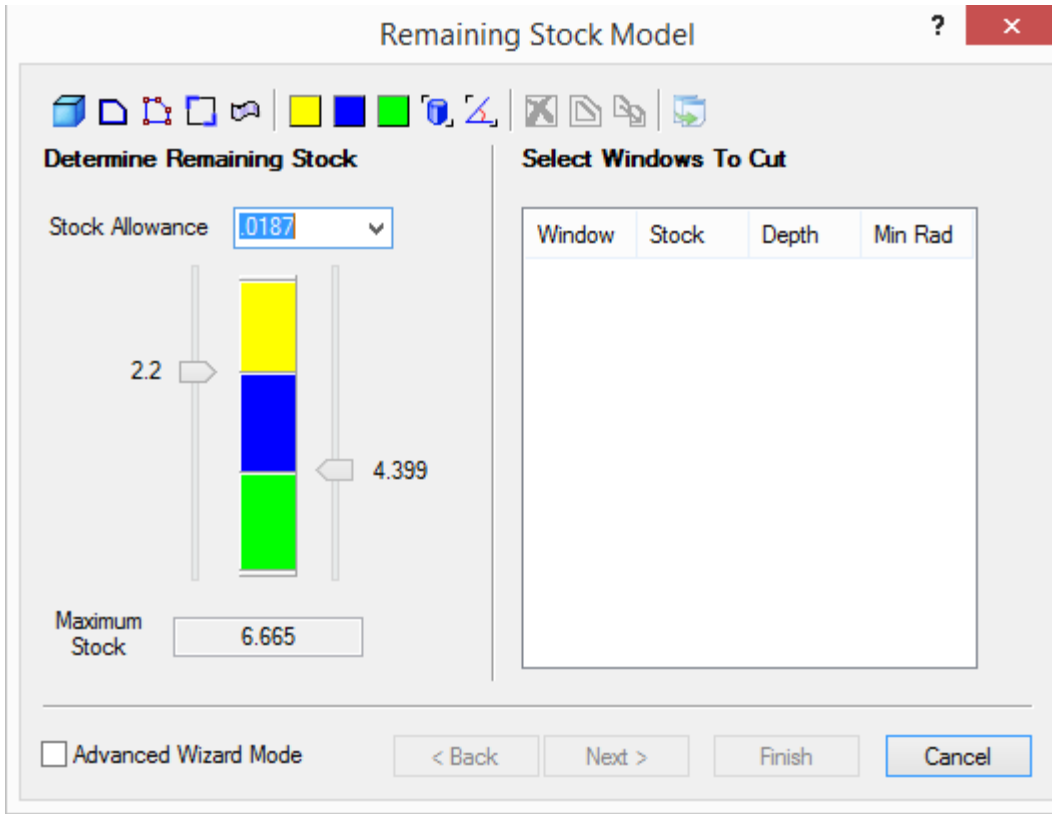
Let's take a look at Z-Planar With Clear:

Property	Value
Z-Planar With Clear	
Tolerance	Max(Min(("Cutting Strategy Selection,Stock Allowance" / 3.0),.02),.001)
Feed Distance Approach	0.1
Feed Distance Retract	0.050
Maintain Cutting Convention	"Yes"
Step Over	"Z-Planar With Clear,Tool,Maximum Step Over"
Step Down	"Z-Planar With Clear,Tool,Maximum Step Down"
Clearing Style	"Zig Zag Clearing"
Z-Level Transition	If "Z-Planar With Clear,Tool,Configuration,Maximum Ramp Angle" > 0.0 Then "Z-Planar With Clear,Z-Level Transition" = "Contour Ramp" Else "Z-Planar With Clear,Z-Level Transition" = "Off-The-Block" End If
Machine By Pockets	"Yes"
Off-The-Block Cavity Strategy	If "Z-Planar With Clear,Tool,Configuration,Maximum Ramp Angle" > 0.0 Then "Off-The-Block Cavity Strategy" = "Contour Ramp In Cavity" Else "Off-The-Block Cavity Strategy" = "Do Not Cut Cavity" End If
Lift Between Levels	"No"
Start Z	"Stock High Z"
End Z	"Surface Low Z"

This contains Rules for all the Properties for the Z-Planar With Clear Strategy. Notice the Clearing Style is red, not black. This means the rule is overridden in the User database. Black means the rule is from System database. Red means the rule is from User database. User database only contains overridden rules. Let's go back to Prospector to look at another example.

Example 2

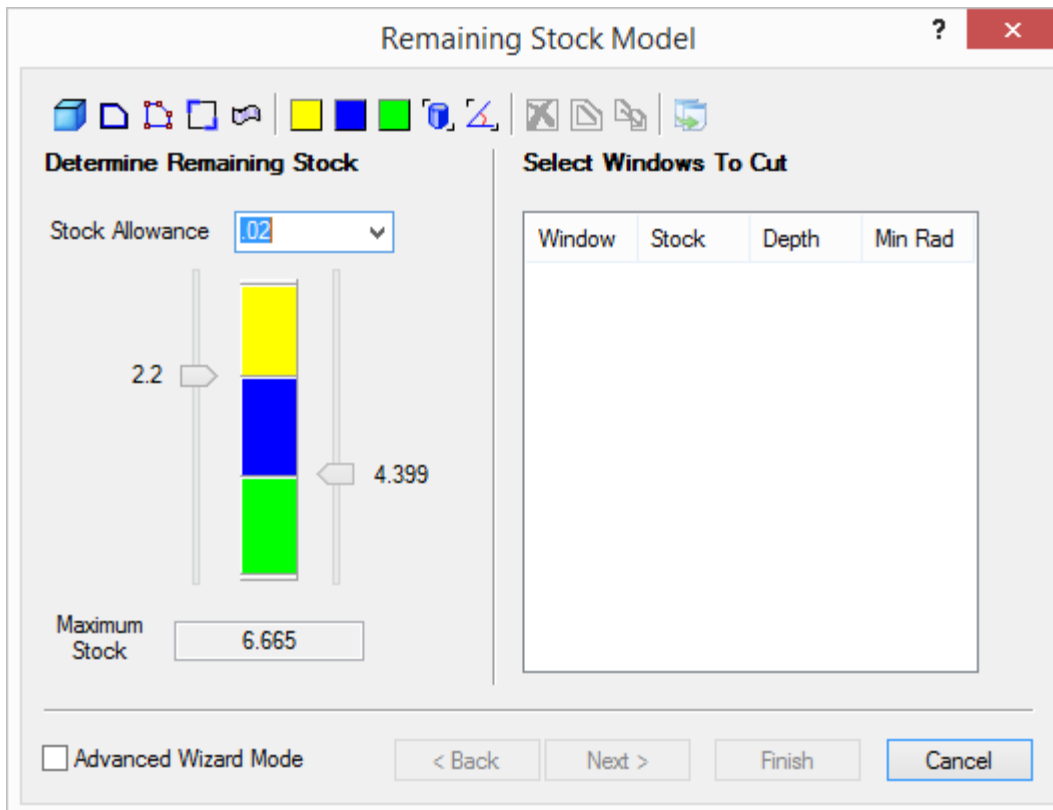
In Semi Finish Category, new 3D Program, instead of 0.0187 as Stock Allowance, I want to use 0.02 for Semi Finish:



Cancel out of the wizard and go back to Insight. Go to Inch/P20/Plastic Injection Mold/Basic Machining/Semi Finish. Some Properties apply to all Strategies, such as Stock Allowance. Change the value to 0.01 and hit Enter to save the Rule:

Property	Value
Stock Allowance	.02

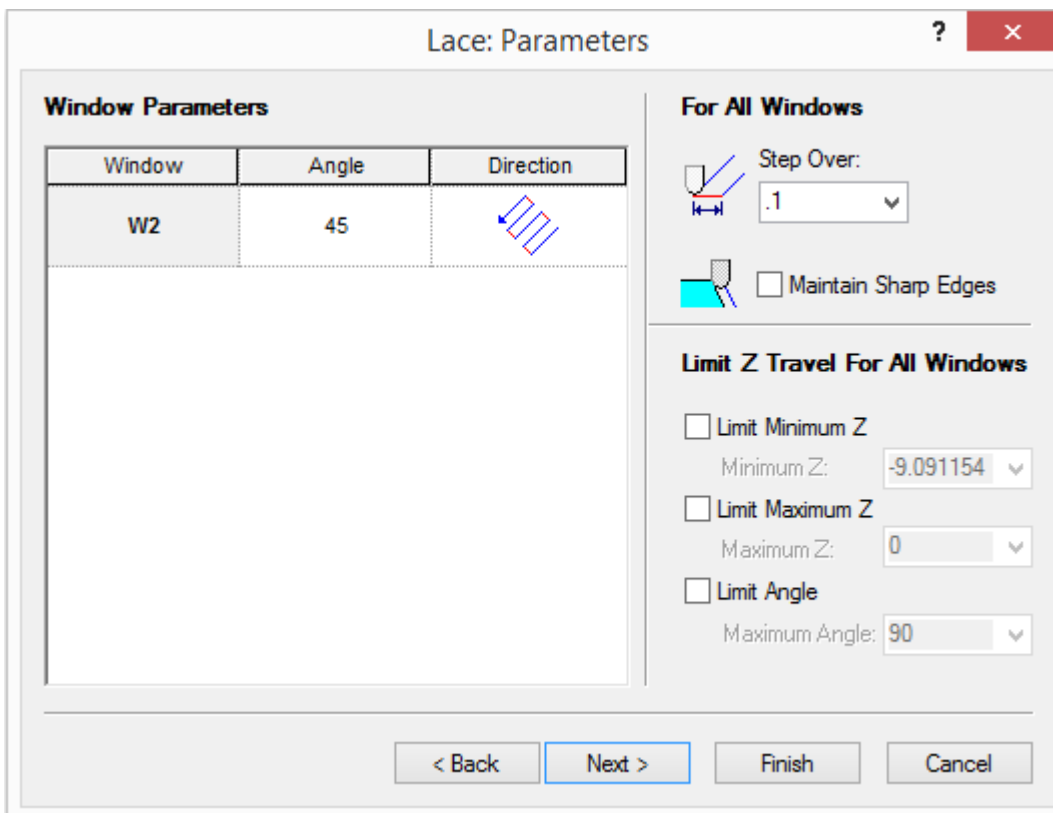
Again, notice that the Rule is Red. Save the Database and head back to Prospector. In Semi Finish Category, new 3D Program. Notice the stock allowance is now 0.02:



Cancel out of the wizard and let's look one final example.

Example 3

In Finish Category, new 3D Program, Window Around Part, Lace, Next your way to the Parameters page. The Cut Angle is 45, I prefer to cut at 90 degrees:



Cancel out of the wizard and go back to Insight. Go to Inch/P20/Plastic Injection Mold/Basic Machining/Finish/3D Strategies/Lace. It's important to pick the right Units/Material/Configuration/Category. Change Cut Angle to 90:

Property	Value
Lace	
Tolerance	Max(Min(("Cutting Strategy Selection,Stock Allowance" / 3.0),.02),.001)
Feed Distance Approach	0.1
Feed Distance Retract	0.050
Maintain Cutting Convention	"No"
Step Over	"Lace,Tool,Maximum Step Over"
Cut Angle	90
Start Quadrant	"First Quadrant"
Limit Minimum Z	"No"
Limit Minimum Z Value	"Surface Low Z"
Limit Maximum Z	"No"
Limit Maximum Z Value	"Stock High Z"

Again, notice it's red. Save the Database and head back to Prospector. Important to emphasize save, Prospector automatically saves Project whenever there's a change, not so in Insight. Go back to Prospector. In Finish Category, new 3D Program, Window Around Part, Lace, and Next your way to the Parameters page, the Cut Angle should be 90:

Lace: Parameters

Window Parameters

Window	Angle	Direction
W2	90	↓

For All Windows

Step Over: .1

Maintain Sharp Edges

Limit Z Travel For All Windows

Limit Minimum Z
Minimum Z: -9.091154

Limit Maximum Z
Maximum Z: 0

Limit Angle
Maximum Angle: 90

< Back Next > Finish Cancel

Cancel out of the wizard.

Summary

- PowerSource - the engine behind Prospector
- Prospector in constant contact with PowerSource, rules are executed at runtime
- Prospector provides PowerSource with information
- PowerSource provides Prospector with Properties
- Databases contain user-defined rules for every Property of every Strategy
- Prospector references a User database
- Two databases
 - System
 - Master database
 - Materials can only be created in the System database
 - Configurations can only be created in the System database
 - Can have any number of associated User databases
- User
 - Derived from System database
 - Overrides rules in System database

- o User preferences