AUTODESK **UNIVERSITY** 2015

MSF11403

Advanced CAMduct Multiple Machine Configuration Including Using the New "Custom NC"

William Tucker
BIM Trainer and Product Specialist, Comfort Systems USA, Inc.

Garrett Tice
Technical Advisor, Applied Software / Enceptia

Learning Objectives

- Learn how to Setup up, manage and use multiple plasma cutters for multiple shops
- Learn how to setup multiple Decoilers
- Setup Processes For Nesting with Multiple Machines
- Learn how to use the new "Custom NC" Machine

Description

Many companies have more than one location. In the past we have used one Fabrication database per location. Multiple databases can make it very difficult to share resources within an organization. The Autodesk Fabrication Development team has provided us tools that we can use to share one database between multiple locations. In this class you will learn how setup the Autodesk Fabrication database for CAMduct to work with multiple companies, branches or divisions. The class will cover how to setup and manage multiple plasma cutters / flatbed tables and multiple decoilers. This class will explain how to control nesting for each location and use the correct sheet sizes. You will learn how to setup processes for the correct machine selection and nesting options. This class will also cover how to use the new "Custom NC" machine for CAMduct.

Your AU Experts

William Tucker *is currently working at Comfort Systems USA, a Premier Mechanical Systems Installation and Service provider, as BIM Trainer and Product Specialist. CSUSA is a national organization with 23 companies, 6 Sheet Metal Fabrication Shops and 154 users currently sharing the Autodesk Fabrication Products with one database. William is responsible for implementing, training, and advising on best practices for these companies, developing standards within the organization, and providing technology recommendations for the future. In the past, William has trained and Implemented Autodesk Fabrication CADmep, ESTmep, and CAMduct as well as utilized it as a 3D detailing and coordination package. William has been using Autodesk Products for 28 years. William enjoys helping others utilize the software to its fullest extent.*

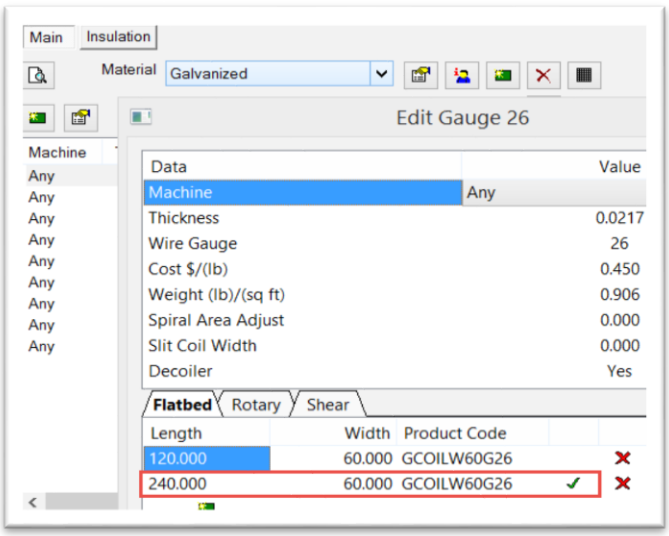
Garrett Tice *is a technical advisor specializing in Fabrication software products. He has extensive experience in installing, configuring, and supporting Fabrication CADmep software, Fabrication ESTmep software, Fabrication CAMduct software, Remote Entry software, and Tracker. Garrett has some unique skills, and has experience configuring, troubleshooting, and supporting various manufacturing equipment linked to Fabrication CAMduct software.*

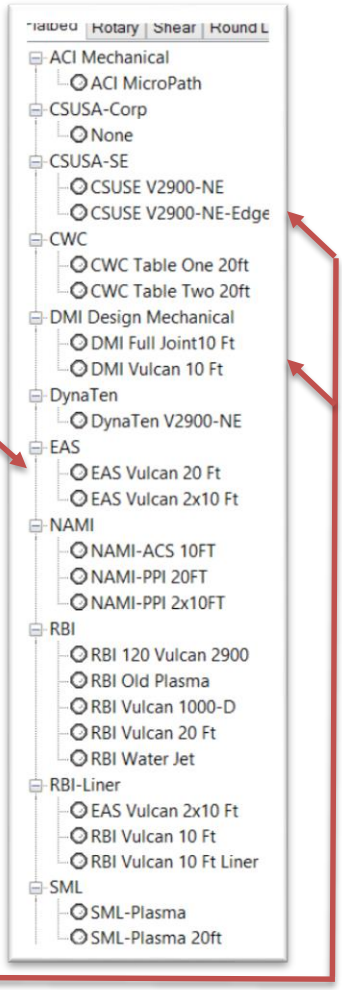
Setup up, manage and use multiple plasma cutters

We are supporting 10 sheet metal shops for Comfort Systems, including 14 flatbed tables, 4 different brands and using 3 different post processors.

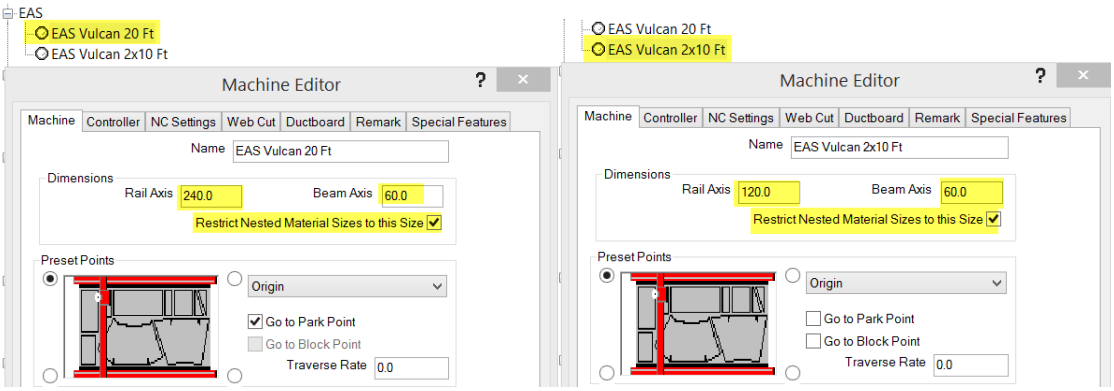
Setup the machines in groups by company/branch

- We have our machines setup by company name groups.
- Due to some material defaults we may have one machine setup multiple times based on sheet sizes.
    - We have the 5' x 20' sheets set as the default sheet size in the materials section of the database. If we have the 10' sheet as default the 20' tables will never pull the 20' sheet, they will pull the 10' sheet. But if we have the 20' sheet set as default, the 10' tables will pull the 10' sheet.





- We may also have a machine setup multiple times for edge nesting
    - (Vulcan 2900 with the D6 post processor)
- When setting up the tables I had to tic the box for "Restrict Nested Material Sizes to this Size", I had to do this for all flatbed machines due to the material defaults.



Setup up, manage and use multiple Decoilers

We have 9 sheet metal shops that have coil lines

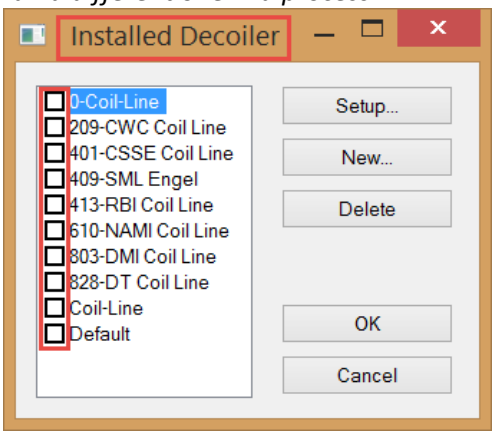
- *5 Iowa Precision Full Coil Lines*
- *1 Engle Coil Line*
- *3 Iowa Precision Front End Coil Lines*

Running the Iowa Coil Lines before we had the "Multiple Coil Line" feature was a challenge. We had to have a macro running in excel to import the DEC file, manipulate it and then write it back.

Manage and use Multiple Decoilers

Multiple Decoilers is actually pretty straight forward, I will just point out a few of the "Do's and Dont's"

- *In the "Installed Decoiler" Interface don't set any Decoiler as default if you are using more than one Decoiler, set it in a Process. I have found conflicts if you have one set as default and try to run a different one in a process.*



- *If you plan to use the Straight Setup in the Pattern Options of the database, you have a few choices*
  - *You will have to set it for all coil lines*
  - *Use profiles and set it up in each profile*
  - *Set this close and take care of the rest of it with scripts. (This is our preferred method)*

Setup Processes for Nesting with Multiple Machines

We have 48 processes for CAMduct. Examples for process types are

- *Branch name-"Nest for 20' Table-1"*
- *Branch name-"Nest for 10' Table-1"*
- *Branch name-"Send to Decoiler"*
- *Branch name-"Print Reports"*
- *Branch name-"Print Part Labels"*
- *Branch name-"Print Coil Line Labels"*
- *Branch name-"Print Spiral Labels"*
- *Branch name-"Execute a Script"*

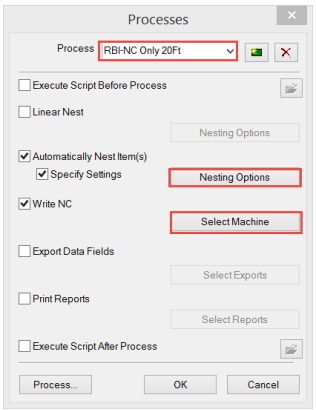
Processes are determined by a company branch's specific needs or shop configuration, I don't think that we have any two companies running the same processes.

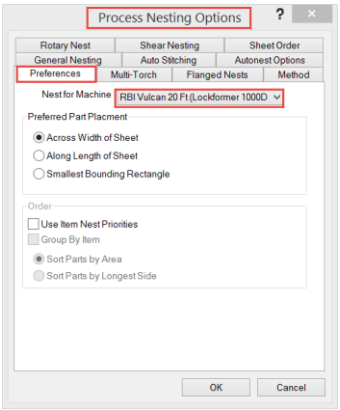
Manage Processes for Multiple Shops

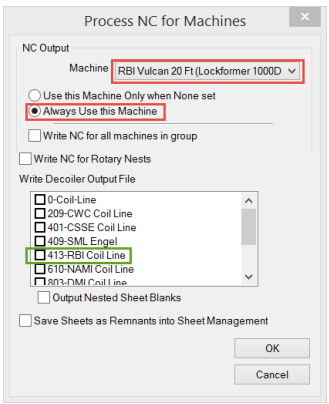
This is an example of one of our largest shop's processes

This process is nesting only on a 20' sheet.

- We are not using the default "Automatic Nesting" for any of the companies, we always use specific settings in the process.
- Under the "Process Nesting Options"> Preferences we always assign the flatbed machine that we want to use for that process.
- Under "Process NC for Machines" we also select the machine that we want to use for that process and tick the button "Always Use This Machine".
    - This is also your opportunity to assign a decoiler to use, if you want to process your decoiled duct at the same time you process your flatbed metal. (We process ours straight at the same time that we process our flatbed metal for most of our companies, but not this one.)

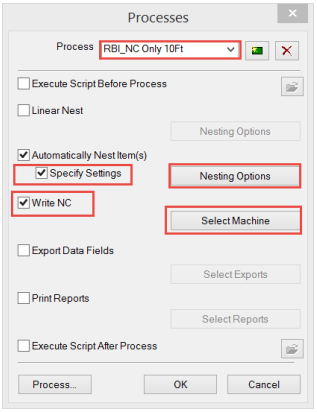


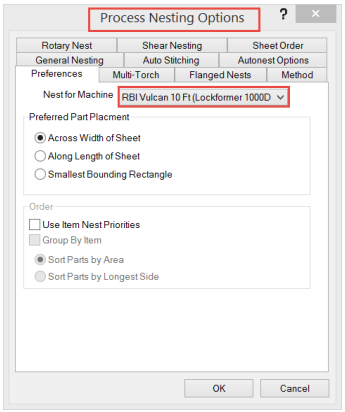


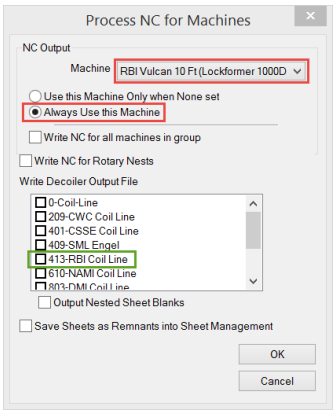


This Process is nesting on a 10' sheet and on the same 20' table, at the same company.

- This is about the same as the 20' sheet but remember in "*Setup the machines in groups by company/branch" I explained that we did not set the 20' sheet as default. We would never be able to use it. Now with the 20' set as default this "Machine will use a 10' sheet".*
    - *Note: if you are using profiles, you do have the option for assigning default sheets per profile.*

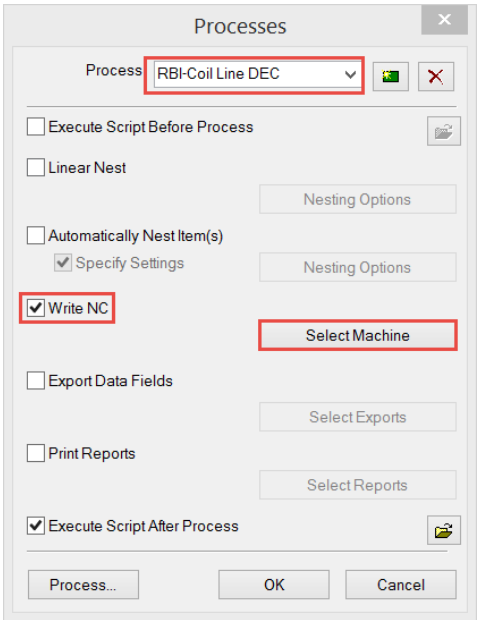


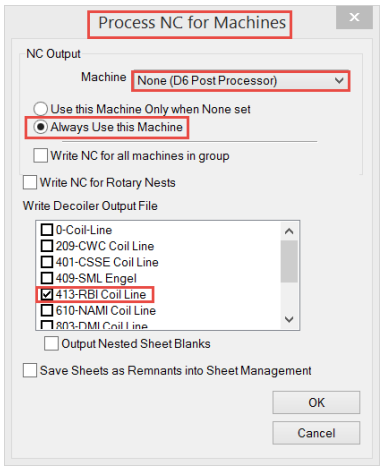




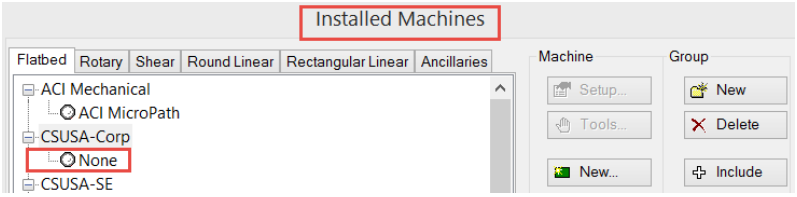
This process is for sending duct to the decoiler only:

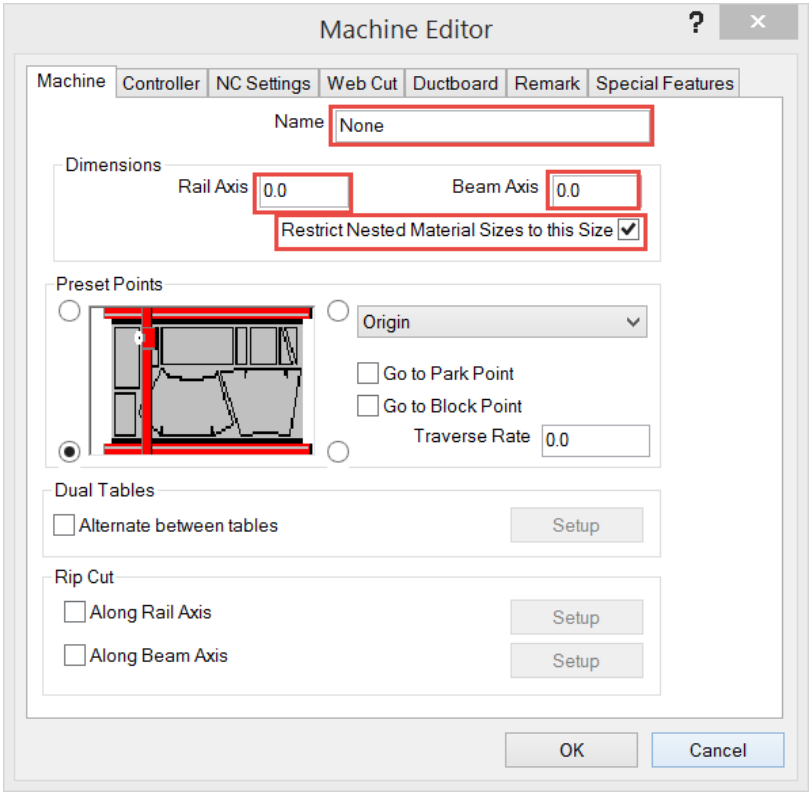
- Notice for this process I am not assigning any nesting options, I am only selecting "Write NC" and selecting a machine.
- For the machine I am selecting a machine named "None" and the button ticked for "Always Use this Machine". I also have the decoiler selected that I want to use.





- For the "None" Machine, I have a table setup as a 0.0 Length and 0.0 Width and the button ticked for "Restrict Nested Material Sizes to this Size", this will not let any flatbed parts get processed at this time.


Installed Machines
Flatbed
Rotary
Shear
Round Linear
Rectangular Linear
Ancillaries
ACI Mechanical
ACI MicroPath
CSUSA-Corp
None
CSUSA-SE
Machine
Setup...
Tools...
New...
Group
New
Delete
Include


Machine Editor
Machine
Controller
NC Settings
Web Cut
Ductboard
Remark
Special Features
Name
None
Dimensions
Rail Axis
0.0
Beam Axis
0.0
Restrict Nested Material Sizes to this Size
Preset Points
Origin
Go to Park Point
Go to Block Point
Traverse Rate
0.0
Dual Tables
Alternate between tables
Setup
Rip Cut
Along Rail Axis
Setup
Along Beam Axis
Setup
OK
Cancel

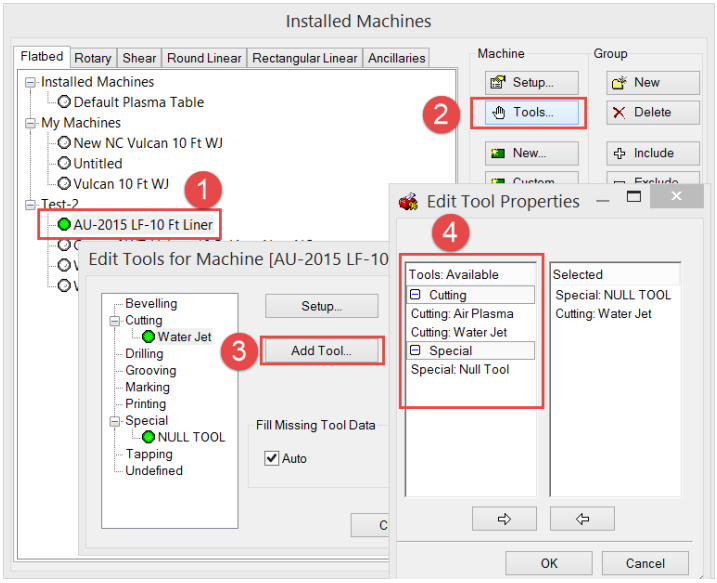
Learn how to use the new "Custom NC" Machine

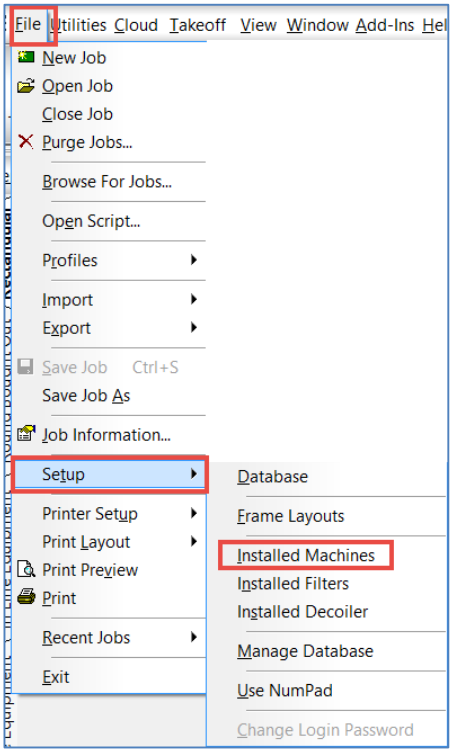
The "Custom NC" will allow users or manufactures to modify existing CNC post processors to change some features, add new tools, or create post processors for new CNC machines.

I will show an example where I have modified the Lockformer 1000D post processor for a waterjet cutter to add a marking tool to mark the "Item Number" and "Part Index Numbers" on the insulation.

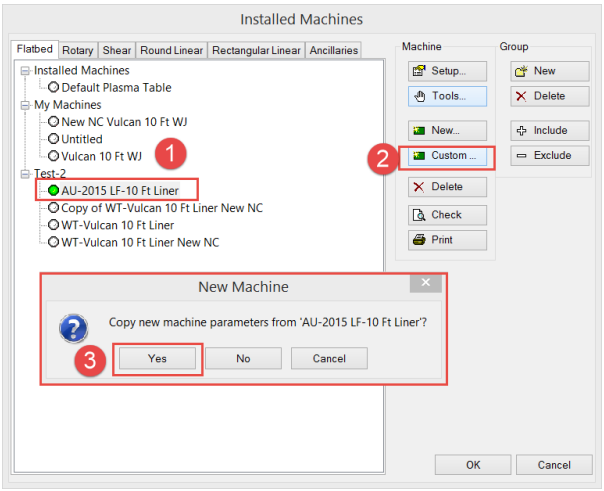
I will look at the existing machine first:

- *Go to the file menu and select Setup > Installed Machines*
- *I am selecting the unmodified machine named "AU-2015 LF-10 Ft Liner" to show that I do not have a "Marking" Tool available.*

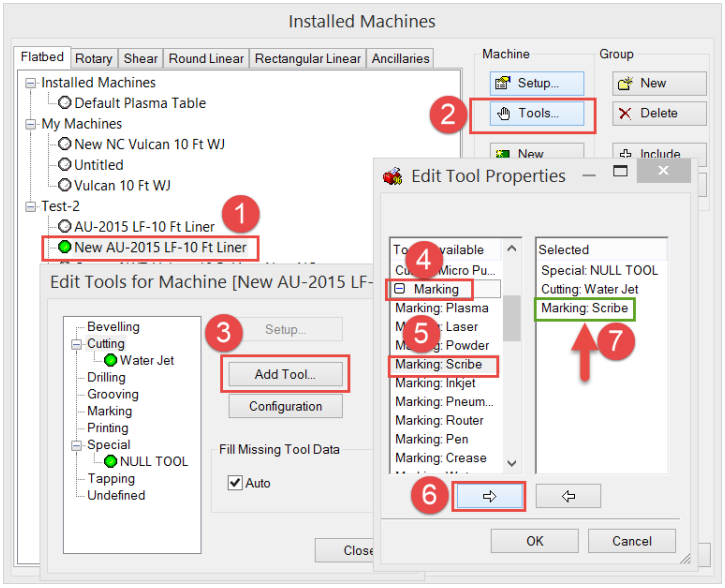




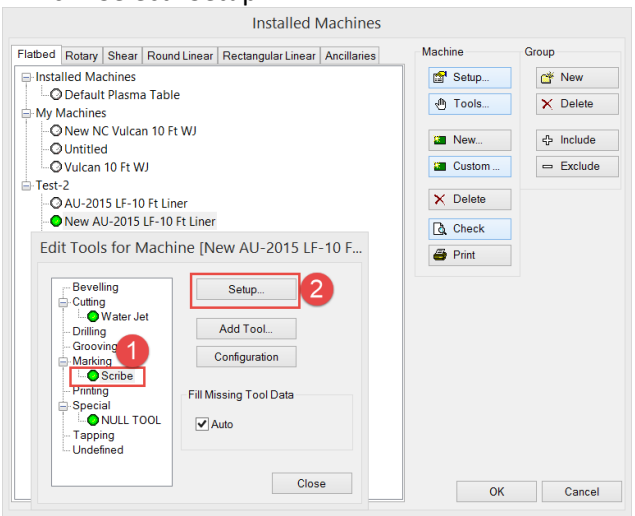
- I will now create a new machine based off of this existing machine.
    1. With the existing Machine selected *"AU-2015 LF-10 Ft Liner"*.
    2. Select Custom
    3. Select "Yes" to create a copy of the existing machine.
    4. I am going to rename that Machine to *"New AU-2015 LF-10 Ft Liner"*



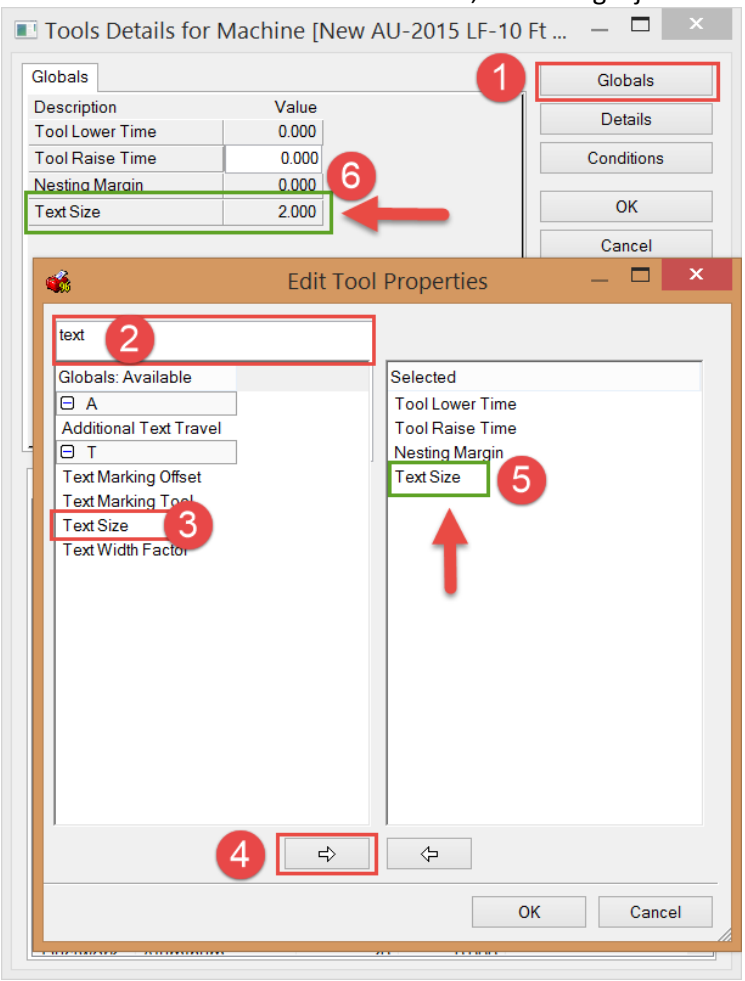
- I will now add the "Marking" Tool the new Machine
    1. With the *"New AU-2015 LF-10 Ft Liner" Machine selected*
    2. *Click to "Tools"*
    3. *Select "Add Tool"*
    4. *Scroll to the "Marking" Group*
    5. *Select "Marking Scribe"*
    6. *Select the arrow at the bottom to add the tool*
    7. *We now have the tool added to the machine*
    8. *Select "OK" to accept the "Edit Tool Properties"*



- We have added the new "Marking" tool, we now need to configure the tool
    - Select the "Scribe" tool
    - Select "Setup"

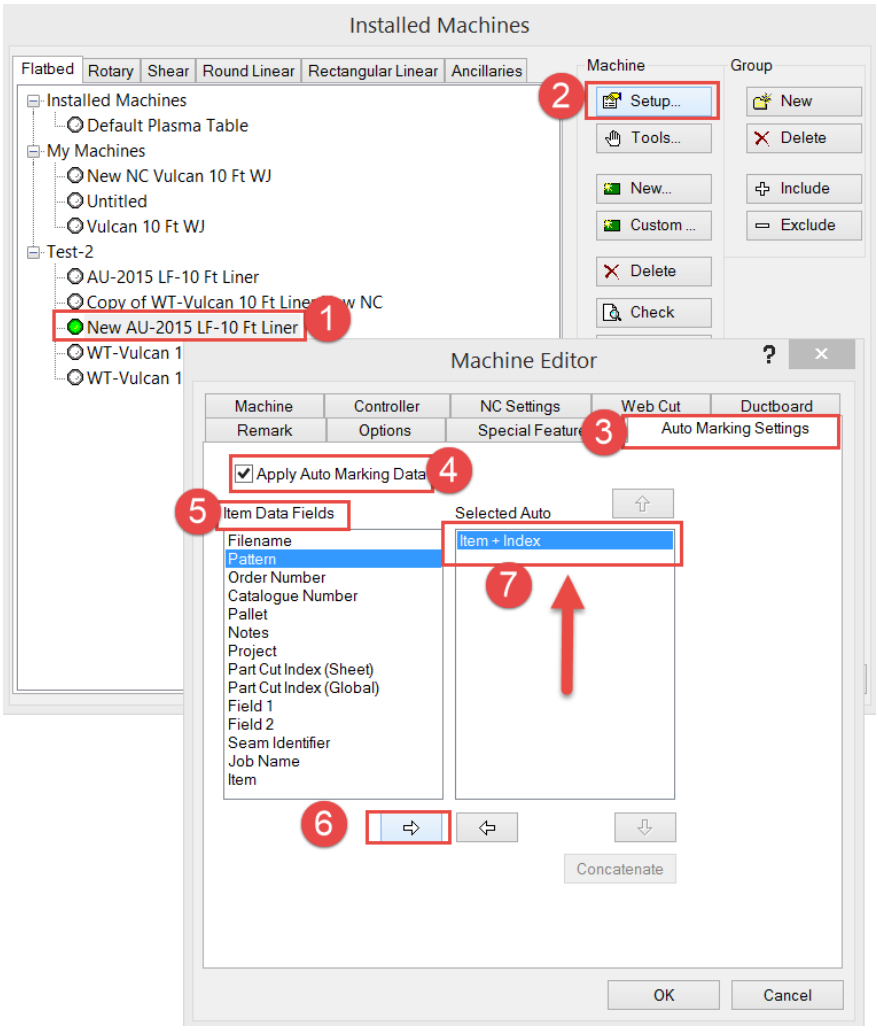


- We are in the "Tools Details" Editor and we need to add a "Textsize" to the Global tools.
    1. Select "Globals"
    2. Type "Text" into the filter field
    3. Select "Text Size"
    4. Select the arrow at the bottom to add the "Text Size" object
    5. We now have the "Test Size" object in the global section, select ok to accept it
    6. Give the "Text Size" a value, I am using 2 just for this demonstration



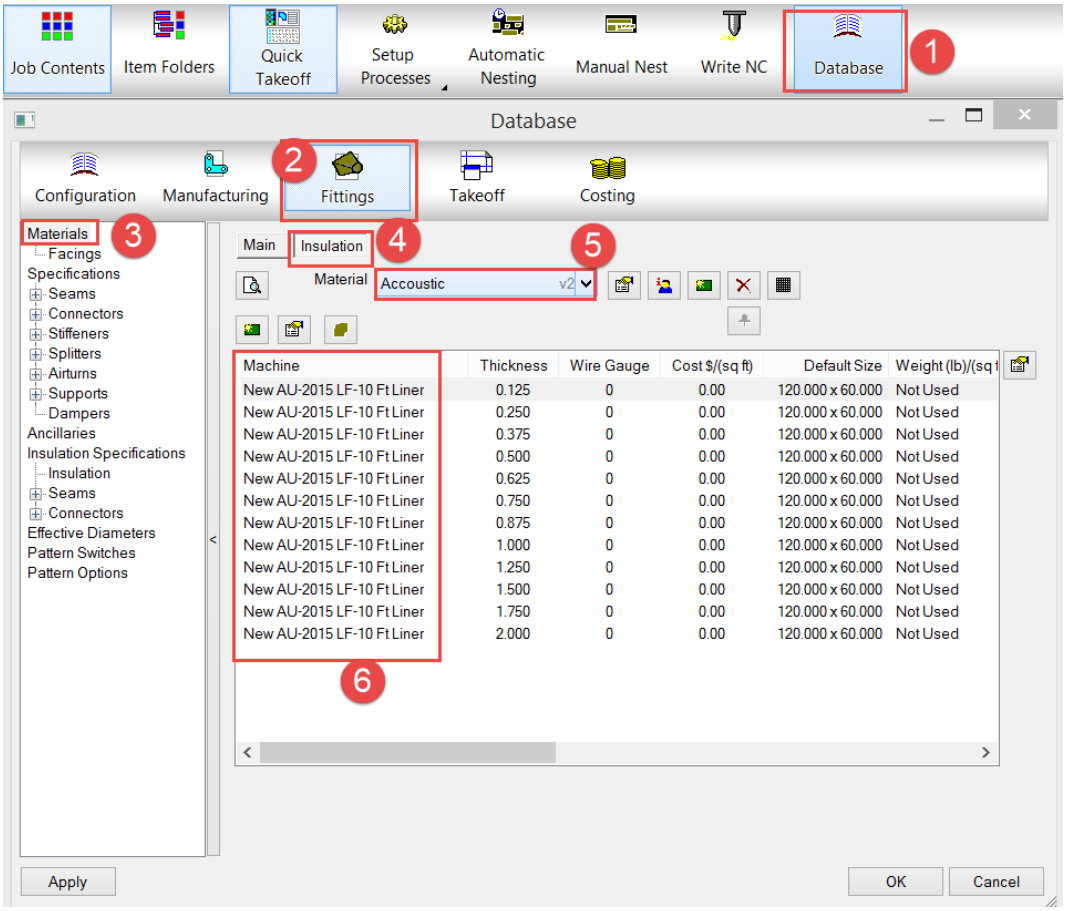
    7. Select ok for "Tool Details for Machine"
    8. Select "Close" for "Edit Tools for Machine"
    9. Select "Check" to check that all materials have tool data applied
    10. Select "OK" for "Installed Machines"

- Now that we have our tool setup we need to tell the tool what we want scribe with it
    1. With the *"New AU-2015 LF-10 Ft Liner" machine selected*
    2. Select "Setup"
    3. You will notice that you now have a new tab "Auto Marking Settings", select the tab.
    4. Check the box for "Apply Auto Marking Data"
    5. In the "Item Data Fields" select "Item + Index"
    6. Select the arrow at the bottom to add "Item + Index" to the list
    7. We now have the "Item + Index" in our list

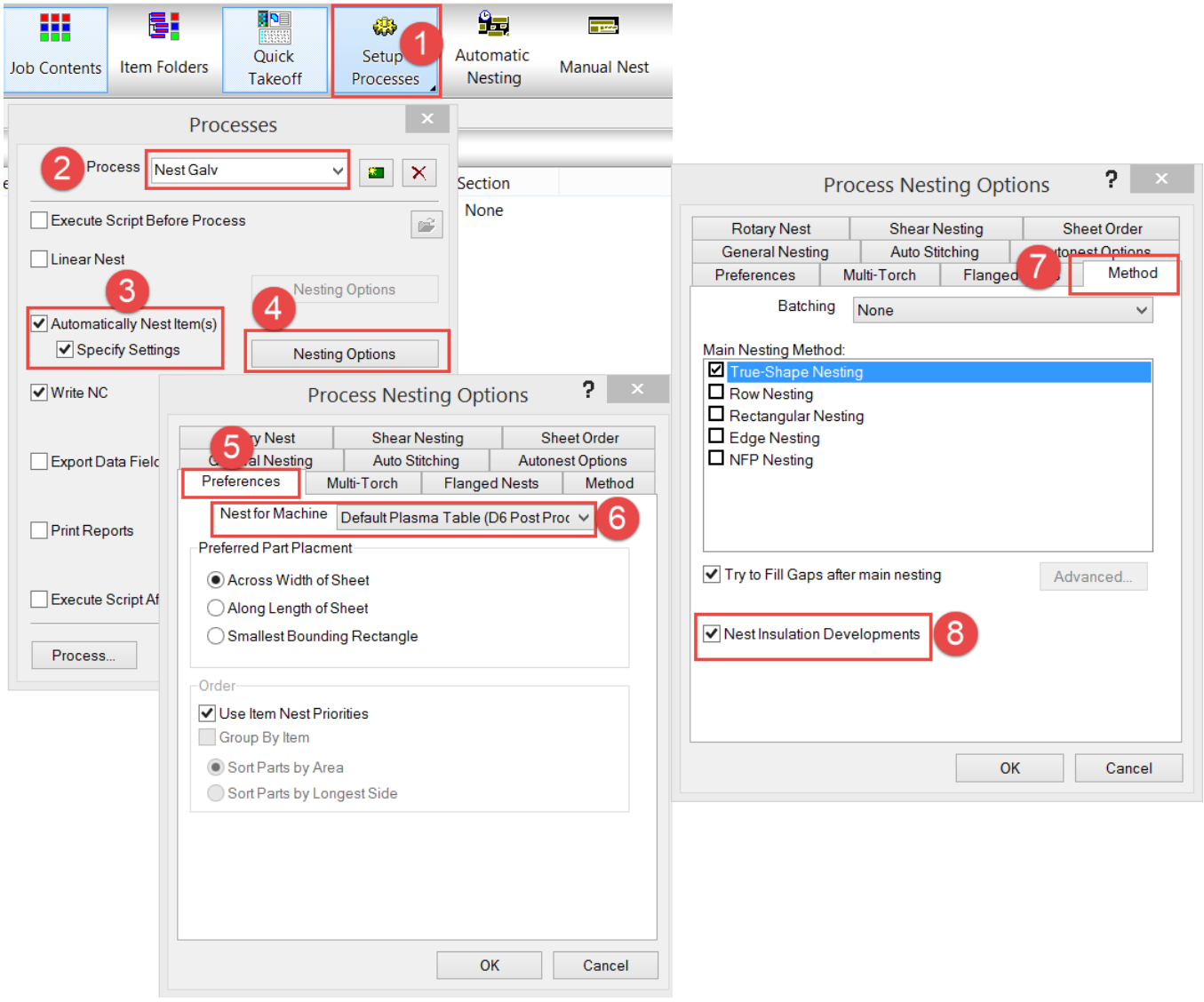


- The machine should now be setup to mark the "Item Number" + "Part Index Number".

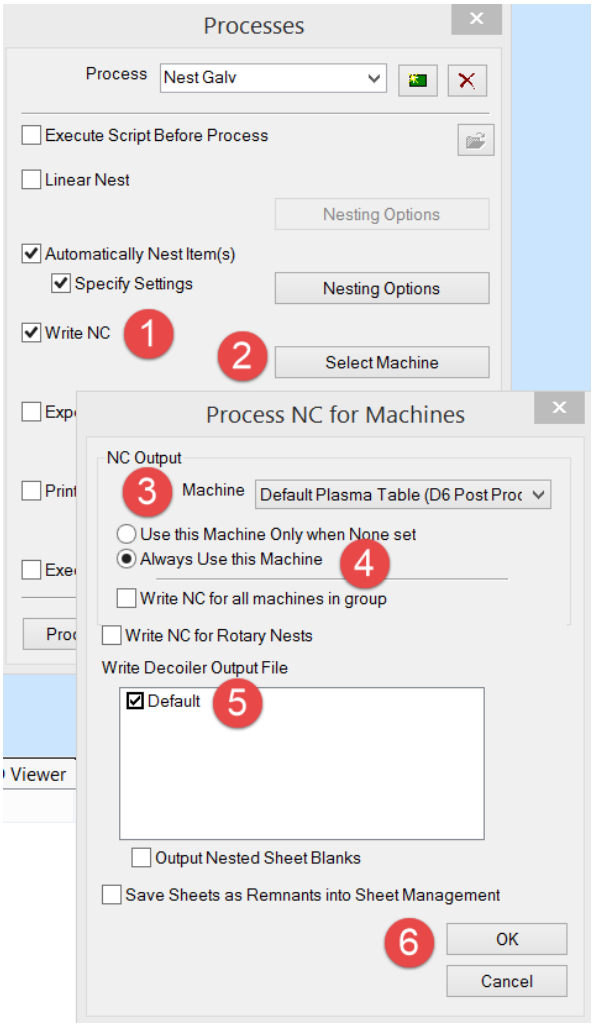
- We now need to setup a process to metal and insulation at the same time
    - To start with, I want to assign my liner to use that new machine



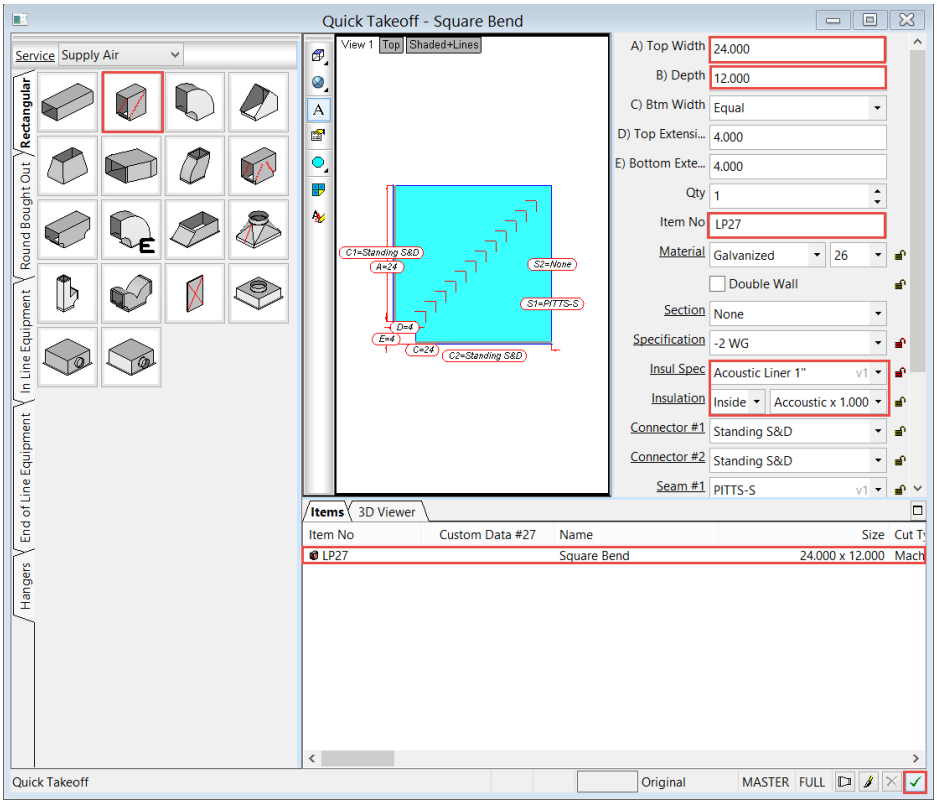
1. I am creating a new process
2. I will name the process "Nest Galv"
3. Check the boxes for "Automatic Nesting" and "Specific Setting"
4. Select "Nesting Options"
5. Select the "Preferences Tab"
6. Select the table that you use for your metal
7. Select the "Method Tab"
8. Check the box for "Nest Insulation Developments"
9. Click "OK" to accept the changes for the "Process Nesting Options"



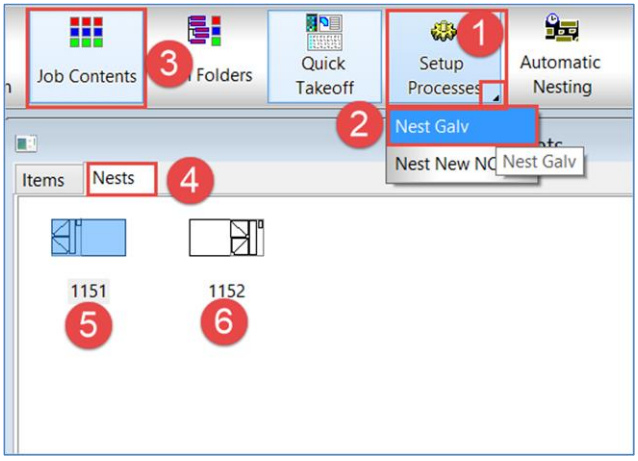
- Now I will set the process to write the NC
    1. Check the box for "Write NC"
    2. Click "Select Machine"
    3. Assign the machine that you use for your metal
    4. Tick the button for "Always Use this Machine"
    5. If you want to send your decoiled duct select the decoiler that you want to use
    6. Select "OK" to accept the changes
    7. Select "OK" for the "Processes"



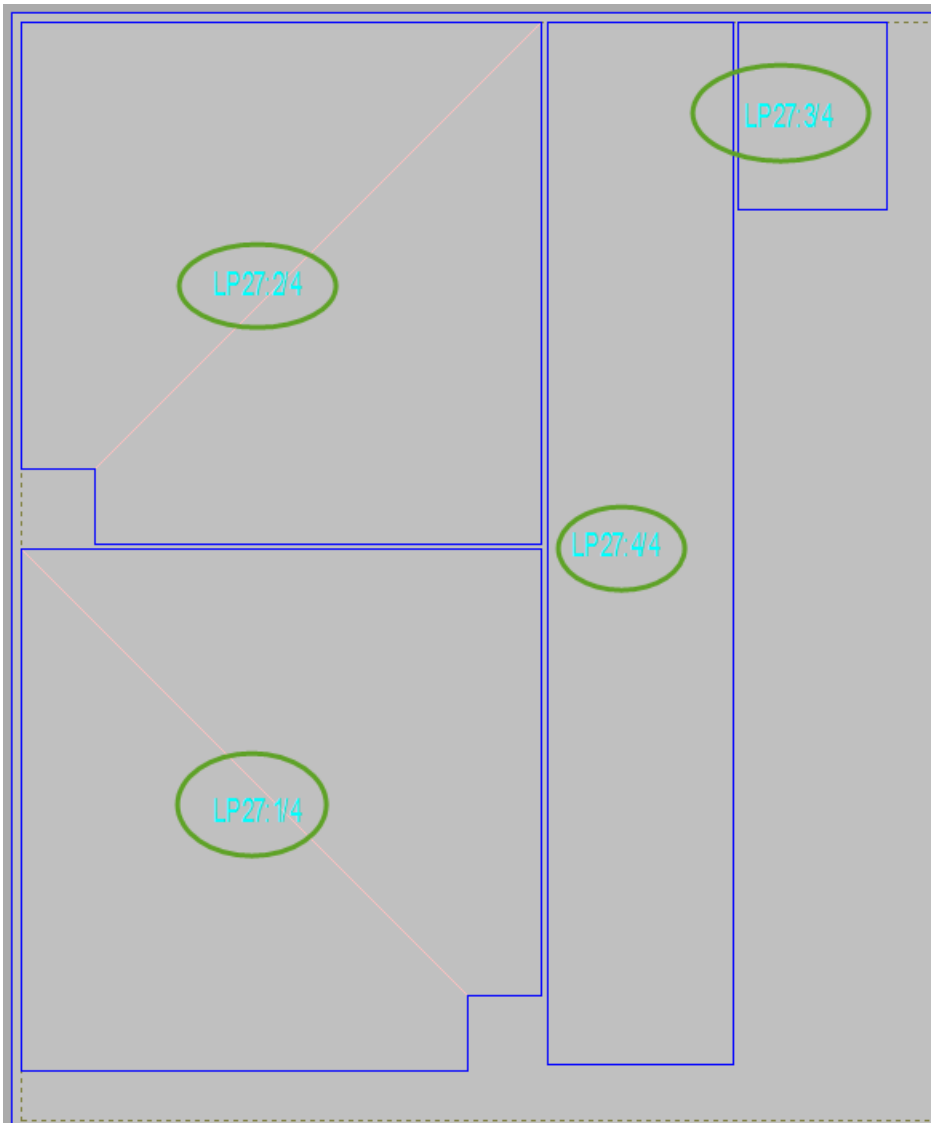
- Let's test the machine by adding a 24x12 square elbow with 1" liner to the takeoff, I am giving mine a number of "LP27"



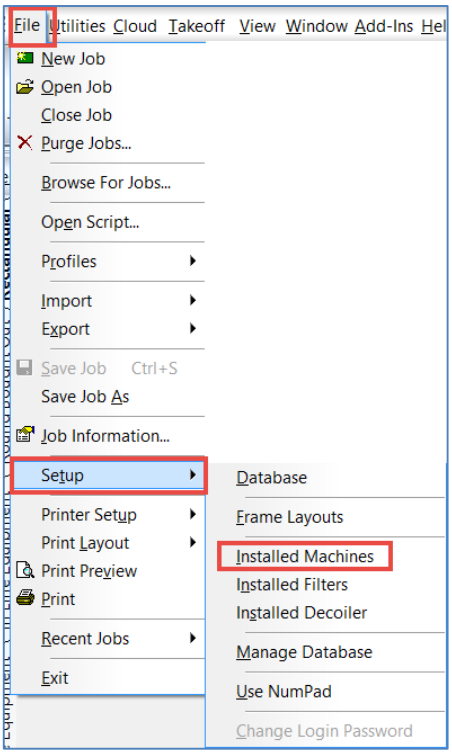
- Let's process the square elbow
  1. Click and hold "Setup Process"
  2. Drag down to your new process and let off of the mouse button, this should process the elbow
  3. Click to the "Job Contents" tab
  4. Click on the "Nest" tab and you should see 2 nest sheets
  5. This sheet should be you insulation nest
  6. This should be the metal nest
- Double click on the insulation nest and select "OK" for the warning

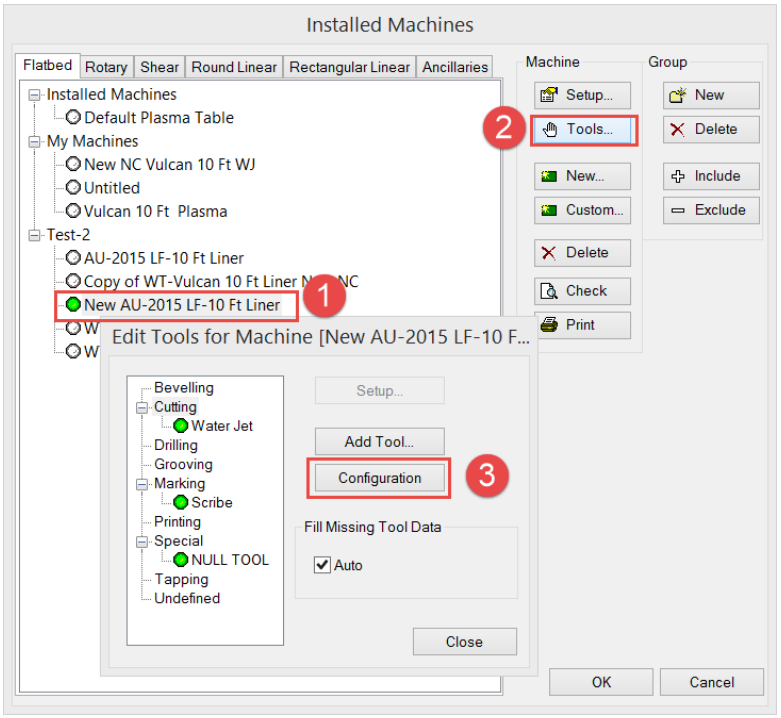


- You should now see the text on the parts with the item number and part index numbers



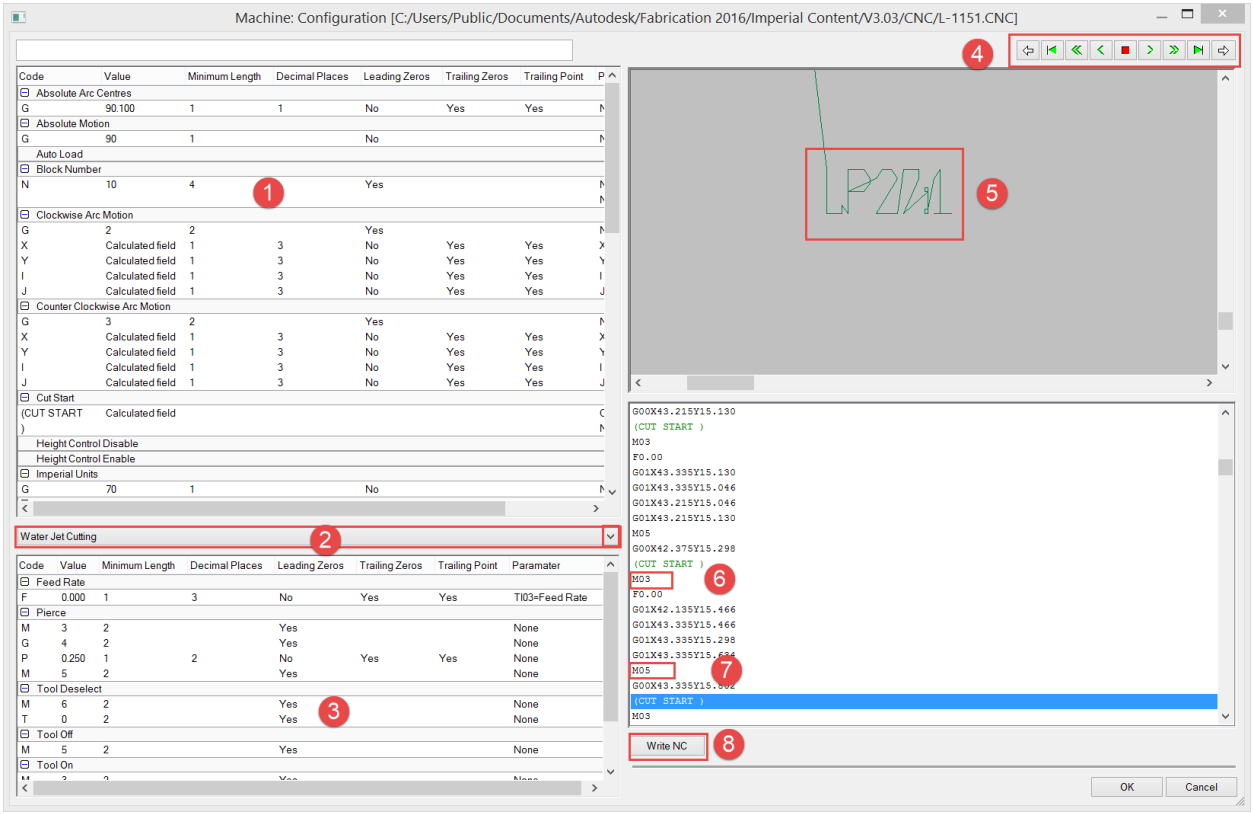
- Let's look at the machine customization
- Select File > Setup > Installed Machines
    1. Select the *"New AU-2015 LF-10 Ft Liner" machine*
    2. Select "Tools"
    3. Select "Configuration"





We are now in the Machine: Configuration editor where you can modify and test the code

1. This is the "Machine Motion Configuration", this dialog contains settings that let you specify the NC code for controlling general machine behaviors, such as:
    - Arc Centers: Absolute, Relative
    - Motion: Absolute, Relative, Arc, Linear, Clockwise, Counter Clockwise
    - Feed Rate
    - Units
    - Kerf
    - Offset Origin
    - Program Start\End
    - Rapid Traverse
    - Subroutines
    - Block Numbers
    - Cut Start
    - Part Start
    - Remarks

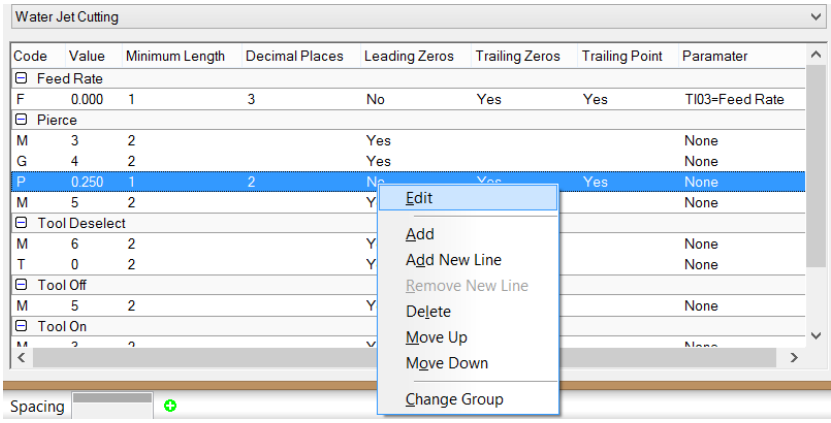


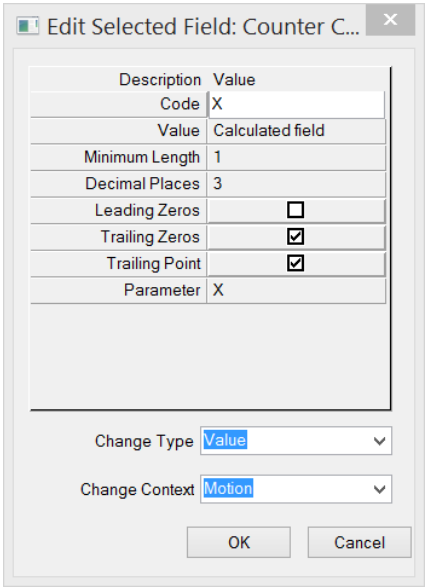
2. This is the tool selection drop-down list to display and select each of the tools that are included with this machine. Only the tools that have been added to the selected machine are displayed in this list.

3. This dialog contains settings that let you specify NC code for the following tool-specific behaviors for each of the tool types that are included on the currently selected machine
    - Pierce
    - Tool Deselect
    - Tool Off
    - Tool On
    - Tool Select
4. This dialog displays an NC view of the nested sheets for the current job. The buttons located along the top of this pane provide a variety of options for stepping through the machine motion. For example, you can go to Previous Sheet/Next Sheet, Start\End, Backwards, Forwards.
   The buttons located along the top of this pane provide a variety of options for stepping through the machine motion. For example, you can go to Start\End, Backwards, Forwards

5. This area is the machine cut path, notice that we have our new scribed text.
6. "M03" is the code for "Tool On"
7. "M05" is the code for "Tool Off"
8. If you want to modify the code you can write the NC again from here to test it.

    - If you want to modify any of the parameters
        - Right click on the line and select edit





Personal Notes:

Personal Notes:

Personal Notes: