

MFG125535-L

## **CAM Certificate 1 of 5: Fundamentals**

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### **Learning Objectives**

- Creating and managing Tool Libraries
- Creating and understanding CAM Setup
- Using integrated CAD functionality to increase manufacturing efficiency
- Applying manufacturing concepts to various situations

### **Description**

This class will cover the fundamental concepts of programming in Fusion 360. Attendees should expect to learn core concepts necessary for programming any part as well as general best practices from seasoned machinists and product experts.

### **Speaker(s)**

Derek Goodwin is a CNC machining veteran with 30+ years in the industry. He is currently serving as the Applications Business Manager at Selway Machine Tool Co. in Union City, CA where he developed the Autodesk HSM CAM resale business. Most recently he launched a World Class training program through Selway for CAD/CAM, CNC Programming, Haas Machine Tool operation, and Machine Simulation. Derek started his career in the U.K. while attending Carlett Park College of Technology. After returning to the U.S. he founded Goodwin Design and Manufacturing; providing precision machined components to Silicon Valley high-tech firms for 15 years. After selling his company in 2004, Derek joined the international design firm IDEO, where he led the prototyping team for eight years. Toward the end of his tenure he taught CAD/CAM Programming at DeAnza College in Cupertino California.

Marti graduated from University of California, Berkeley where she earned her B.S. Mechanical Engineering and explored manual and CNC manufacturing processes in the Berkeley Student Machine Shop using MasterCAM, HSMWorks, and InventorHSM. Using this experience, she has been working at Autodesk for over 2 years, first developing training and adoption strategies for Fusion 360 users with a focus in manufacturing and now driving awareness for Fusion 360 and its manufacturing capabilities.

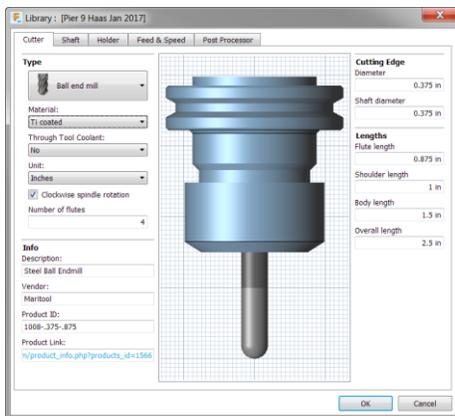
## Tool Libraries

Tool libraries store and recall tool information to ensure that toolpaths are calculated and simulated as exactly as possible. By modeling and maintaining a tool library of the tools used in your machine, you make sure Fusion is using the most accurate and up to date tools. Watch a short video on the basics of tool libraries here:

<http://f360ap.autodesk.com/courses/fundamentals-of-milling/lessons/lesson-1-tool-library>

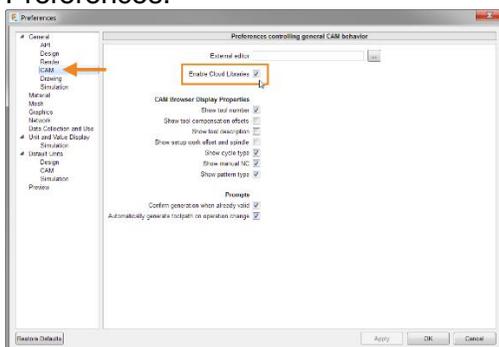
### Create a Tool

When creating a tool, use the catalog to directly enter the tool parameters into the dialog box. Move through the tabs to add a tool holder, define the tool speeds and feeds, and set the tool number used by the post processor. The tool number used should match its number in the machine.



### Cloud Library

To use Cloud libraries, make sure they are enabled in the General > CAM section of Preferences.



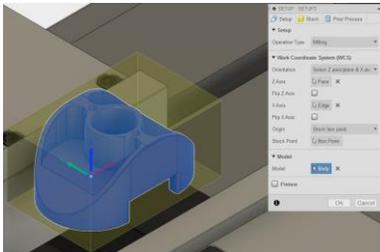
## CAM Setups

The Setup defines the stock and model material, and is the foundation for the toolpath calculation. All the model intelligence Fusion 360 uses is based off the definition in the Setup. The Work Coordinate System orientation and origin defined here should also match how the part is located in the machine. Watch a short video on the basics of Setups here: <http://f360ap.autodesk.com/courses/fundamentals-of-milling/lessons/lesson-2-setup>

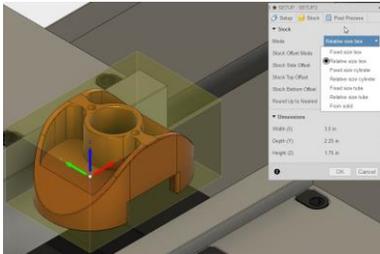
### Create a Setup

The Setup command is the very first command in the toolbar of the CAM Workspace, and it's the first thing you will do when programming a part.

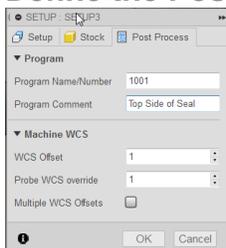
### Define the WCS & Model



### Define the Stock



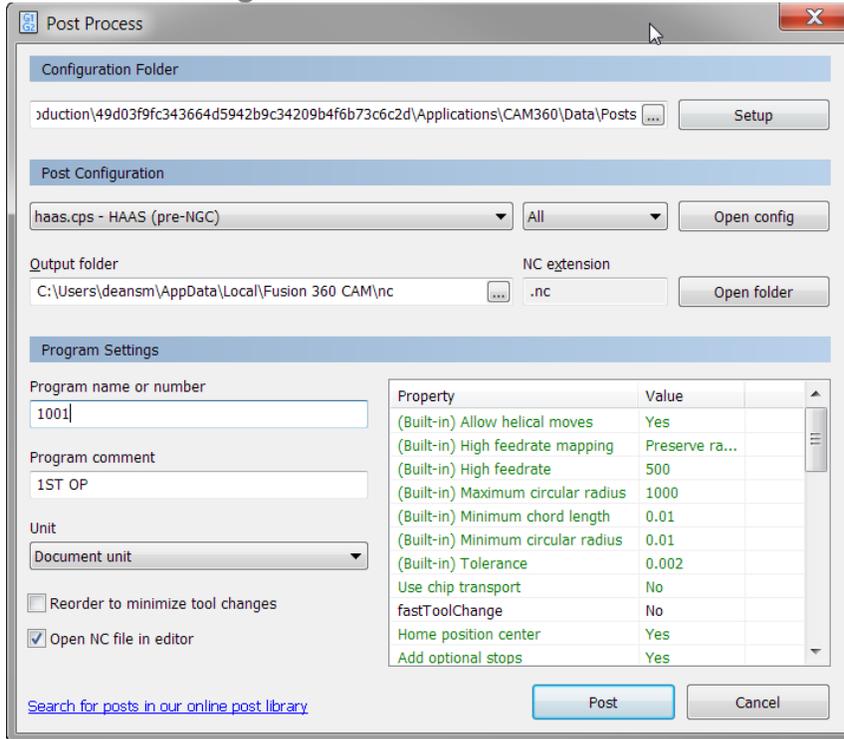
### Define the Post Settings



## Post Processing

Post processing turns the toolpaths calculated by Fusion 360 into code that the CNC machine can run, enabling you to execute the operations.

### Post Processing



**Configuration Folder**

...duction\49d03f9fc343664d5942b9c34209b4f6b73c6c2d\AppData\Local\Fusion 360\CAM\Data\Posts ... Setup

**Post Configuration**

haas.cps - HAAS (pre-NGC) All Open config

**Output folder** **NC extension**

C:\Users\deansm\AppData\Local\Fusion 360\CAM\nc .nc Open folder

**Program Settings**

Program name or number: 1001

Program comment: 1ST OP

Unit: Document unit

Reorder to minimize tool changes

Open NC file in editor

Property	Value
(Built-in) Allow helical moves	Yes
(Built-in) High feedrate mapping	Preserve ra...
(Built-in) High feedrate	500
(Built-in) Maximum circular radius	1000
(Built-in) Minimum chord length	0.01
(Built-in) Minimum circular radius	0.01
(Built-in) Tolerance	0.002
Use chip transport	No
fastToolChange	No
Home position center	Yes
Add optional stops	Yes

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## **Additional Resources**

Tool Libraries: <http://f360ap.autodesk.com/courses/fundamentals-of-milling/lessons/lesson-1-tool-library>

Setup: <http://f360ap.autodesk.com/courses/fundamentals-of-milling/lessons/lesson-2-setup>

Post Processing: <http://f360ap.autodesk.com/courses/fundamentals-of-milling/lessons/lesson-8-post-processing>

Enhanced G-Code Viewing: <http://f360ap.autodesk.com/courses/fundamentals-of-milling/lessons/quick-tip-enhanced-g-code-viewing>