

CNC Mills

A b o u t	CNC Mills cut material with rotating tools along an computer controlled path to make parts. With simultaneous 3-axis motion and precise position control, CNC mills can machine unique 3D surfaces and cut features to ~0.025 mm (0.001 in.) tolerances. The CNC mills in the Garage have an easy to use interface and an abundance of online learning content to introduce makers to CNC machining.
C a t e g o r y	Metal Working
L o c a t i o n	Back Room

Model Specifics

Properties	Status	Materials	About
Tormach PCNC 770	AVAILABLE	- Aluminum - Mild Steel - Soft Plastics - Other materials with consultation	- Smaller, faster, and better suited for aluminum and plastics - Axis Travel (X, Y, Z): 355, 185, 336 mm (14, 7.32, 13.25 in.) - Spindle Speed: 525 to 10000 rpm - Spindle Power: 745 W (1 hp) - Max Table Load: 181 kg (400 lbs)
Tormach PCNC 1100	AVAILABLE	- Aluminum - Mild Steel - Soft Plastics - Other materials with consultation	- Larger, more powerful, more rigid, and better suited for steel - Axis Travel (X, Y, Z): 457, 241, 419 mm (18, 9.5, 16.5 in.) - Spindle Speed: 500 to 5140rpm - Spindle Power: 1118 W (1.5 hp) - Max Table Load: 227 kg (500 lbs)



Tormach PCNC 770



Tormach PCNC 1100

Standard Operating Procedure



Google Apps Sign-in Required

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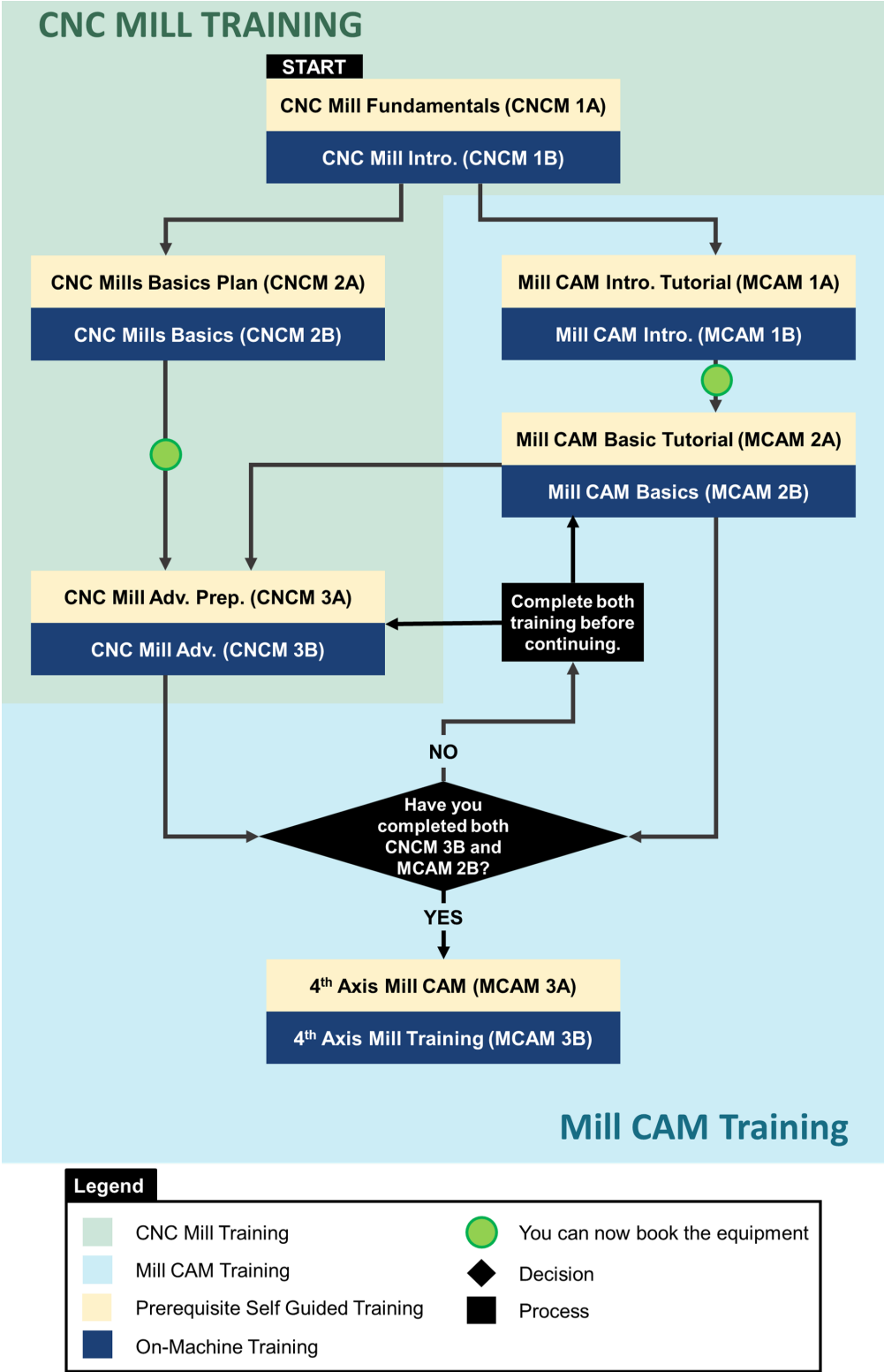
Training



After completing at least 2 training levels (up to MCAM 1B or CNCM 2B, inclusive), the first independent use will be a shadowed session.

CNC mill training is separated into two streams - CNC mill training and mill CAM training. The flowchart below outlines the training workflow.

- CNC mill training uses the software on the machine computer to create toolpaths to machine simple parts.
- Mill CAM training uses CAD and CAM software to create toolpaths to machine complex parts.



Training is scheduled on an email request basis. Please email us at garage@ualberta.ca if you are interested in starting the CNC mill training.

CNC Mill Training

Training	Type	Time Estimate	Prerequisites	Checklist /Document

CNC Mills - 1A Fundamentals	SELF-GUIDED DOCUMENT	0.5 hrs.	None
CNC Mills - 1B Intro.	ON-MACHINE	3 hrs.	CNC Mills - 1A Fundamentals
CNC Mills - 2A Basics Plan	SELF-GUIDED DOCUMENT	1 hrs.	None
CNC Mills - 2B Basics	ON-MACHINE	2 hrs.	CNC Mills - 1B Intro. and CNC Mills - 2A Basics Plan
CNC Mills - 3A Advanced Prep.	SELF-GUIDED DOCUMENT	0.5 hrs.	None
CNC Mills - 3B Advanced	ON-MACHINE	50 min.	CNC Mills - 2B Basics or Mill CAM - 2B Basics , and CNC Mills - 3A Advanced Prep.

Mill CAM Training

Training	Type	Time Estimate	Prerequisites	Checklist/Document
Mill CAM - 1A Intro. Tutorial	SELF-GUIDED DOCUMENT	3 hrs.	None	
Mill CAM - 1B Intro.	ON-MACHINE	3 hr.	Mill CAM - 1A Intro. Tutorial and CNC Mills - 1B Intro.	
Mill CAM - 2A Basics Tutorial	SELF-GUIDED DOCUMENT	3 hrs.	None	
Mill CAM - 2B Basics	ON-MACHINE	3 hr.	Mill CAM - 1B Intro. and Mill CAM - 2A Basics Tutorial	

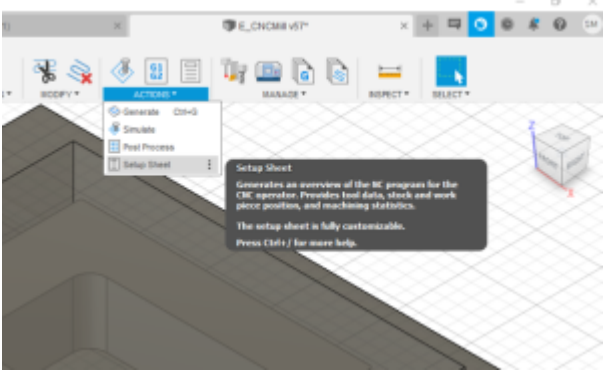
Documentation



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Safety Data Sheets	Way Lube Oil 68 Durakut 4010 Machining Coolant Kool Mist Formula 78 Machine Coolant
Hazard Assessments	

Application Resources	CNC Mill Machining Parameters (Feeds & Speeds) Blank Machining Plan: Computer Aided Machining (CAM): • CAM Access • CAM Configuration • CAM Learning • Workholding Models • Export a setup sheet to easily review CAM parameters:  The screenshot shows the E_CNCMB v5P software window. The 'Generate' menu is open, showing options: Generate (Ctrl+G), Simulate, Post Process, and Setup Sheet. A tooltip for 'Setup Sheet' is visible, stating: 'Generates an overview of the NC program for the CNC operator. Provides tool data, clock and work piece position, and machining statistics. The setup sheet is fully customizable. Press Ctrl+J for more help.' The background shows a 3D model of a machined part on a grid. Advanced Workflows: • Aligning Workholding - • Changing Tools - External Resources: • Tormach Youtube Channel • NYC CNC ◦ Fixturing & Workholding Series • Titans of CNC • How to Read a Metric Vernier Caliper • Garr Tool Speeds and Feeds Guide:
Manufacturer's Manuals	