



# Manual Milling Skills

## OVERVIEW

This certification validates that an individual has the skills and knowledge to successfully complete process planning, basic manual milling machining applications, machine set ups, operations, inspection techniques and safety standards.

## COMPETENCIES

## KNOWLEDGE + SKILLS

<b>Applied Mathematics</b>	Arithmetic IPM Calculations (based on given chip load)	SFM to RPM Conversion Use of Scientific Calculator
<b>Cutting Tool Assembly</b>	Configuration (LOC and EOH) Fitting (tightening and setting) Holder Applications	Inspection of Cutters Inspection of Holders
<b>Cutting Tool Selection</b>	Cutter Applications Cutter Features/Attributes	Manufacturers Technical Data References
<b>Geometrical Dimensioning and Tolerancing</b>	Datum Reference Frame (DRF) Degrees of Freedom (DOF) Feature Control Frame Geometric Control Symbols	Geometric Tolerancing Categories Geometric Tolerancing Characteristics Geometric Tolerancing Zone Shapes Symbols Associated with Feature Control Frames
<b>Inspection</b>	Feature with Size Verification Feature without Size Verification Hole Gaging Parallelism Verification	Perpendicularity Verification Position Verification at MMC Surface Finish Verification Thread Gaging
<b>Machine Maintenance</b>	Coolants Gib Adjustment	Oils and Lubrications Refractometer Readings
<b>Machine Safety</b>	Machine Guarding	
<b>Machining Applications</b>	Drilling Face Milling Peripheral Milling	Plunge Milling (optional) Reaming Slot Milling
<b>Material Preparations</b>	Bar Stock Sizes Cutting Blanks	Deburring
<b>Measurements</b>	Reading Micrometers Reading Steel Rule Reading Vernier Scales Use of Calipers	Use of Dial Indicators Use of Drop Indicators (travel dial) Use of Micrometers Use of Steel Rules
<b>Operations</b>	Deburring	Part Loading (vise/fixture)



## Machining Level I Credential Overview

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### COMPETENCIES

### KNOWLEDGE + SKILLS

<b>Print Reading</b>	Block Tolerances Line Types and Conventions Orthographic Projection	Surface Finish Requirements Title Blocks and Revisions
<b>Process Planning</b>	Machine Configuration Machine Selection	Operation Sequencing Workholding Concepts/Devices
<b>Setup</b>	Aligning a Vise/Fixture Establish XY Zero from a Hole	Establish XY Zero from Two Surfaces Tramming
<b>Shop Safety</b>	Blood Born Pathogen Fire Prevention/Suppression Hazardous Material Information System (HMIS) Lock Out/Tag Out	Personal Protective Equipment (PPE) Safety Data Sheets (SDS) Waste Removal