Tennessee Student Industry Credential (TSIC)
Dremel Digilab LC40 Laser Engraver/Cutter

Section 1: Introduction

This pathway details the steps to obtain a Tennessee Student Industry Credential for the Dremel Digilab LC40. Learners of all ages and experience levels have the opportunity to receive this certification through FabFolio. To qualify for the exam, students must earn the following required micro-credentials and score proficient on the practice test. Any related micro-credentials are not requirements for the certification exam, however, may prove useful for beginner and advanced makers.

Microcredential submissions: To receive your micro-credential, you must submit evidence for each criterion bulleted. Acceptable types of evidence can be:

- Submit a document or slideshow with pictures for each criterion and include captions describing each picture.
- Submit video(s) explaining/demonstrating each of the criteria.

Section 2: Required Microcredentials for TSIC Certification

Laser Cutter Operator: (Required for TSIC)

- Use calipers to acquire precise thickness measurements for your material
- Use laser cutter interface/software/app to select appropriate material attributes and ensure correct speed and power settings.
- Send a design to the laser that includes elements to be engraved and cut out. Input the proper settings for each line type.
- Maximize salvageable material when developing a product.
- Show the final product that includes the evidence for this micro-credential

Laser Cutter Technician: (Required for TSIC)

- Clean the lenses and mirrors
- Clean the tray, cutting grid, and internal surfaces
- Clean/inspect the internal vents/fans and down draft ports
- Dust the belts and lubricate the rails
- Inspect/clean the exhaust port and external exhaust fan or filter

Section 3: Related Micro-credentials

Laser Cutter 3D Designer:

- Use at least one 3rd party tool (i.e. makercase, luban, etc) to create a laser-cut 3D model
- Import the files from the 3rd party tool into vector software
- Customize the imported design by adding at least two components to the design (i.e. a logo, hole for a button, etc)
- Set the dimensions of the design space for your laser cutter material, and optimize the layout to reduce waste
- Use appropriate outline and fill settings to achieve the desired outcome with the laser cutter
- Export file(s) in the correct format for your laser cutter's interface/software/app
- Show your final product

Section 4: Dremel Digilab LC40 Laser Engraver/Cutter Certification Procedures

Dremel Certification Preparation:

- Before taking the Dremel Digilab LC40 certification test, students should complete Labs 5-8 in the LC40 Labs document. After completion of the labs, students must go through the Laser Certification Exam Prep and Dremel Digilab LC40 practice quiz.
- Dremel practice quiz will cover the following topics:
    - What does LASER stand for, when were lasers first used, who invented them, and what are the common laser types?
    - Basic setup of the laser, amperage, fluid used for cooling, laser height, tab displays
    - Fan and exhaust usage
    - File types, importing files, dot densities, engraving size, cleaning/maintenance
- Once students show mastery (100%) on the Dremel Digilab LC40 practice quiz, contact the test administrator to register for the Certification Exam.

Dremel Exam Enrollment:

- The campus administrator will first add the student as a *user* on the NC3 Testing Portal. This will then send an email invitation to the student to create their NC3 account.

- At that point, Dremel-certified teachers can assign certification modules to a student through the portal.
- Once all required microcredentials and criteria are met, the teacher will assign the test to the student, who will have 3 attempts to pass with an 80% or above.
- The certificate will immediately be available to the student and teacher and stored in the NC3 Portal.