Apprenticeship
Training Standard

Tool and Die Maker

Trade Code: 430A

Development Date: June 2002
Please Note: Apprenticeship Training and Curriculum Standards were developed by the Ministry of Training, Colleges and Universities (MTCU). As of April 8th, 2013, the Ontario College of Trades (College) has become responsible for the development and maintenance of these standards. The College is carrying over existing standards without any changes.

However, because the Apprenticeship Training and Curriculum Standards documents were developed under either the Trades Qualification and Apprenticeship Act (TQAA) or the Apprenticeship and Certification Act, 1998 (ACA), the definitions contained in these documents may no longer be accurate and may not be reflective of the Ontario College of Trades and Apprenticeship Act, 2009 (OCTAA) as the new trades legislation in the province. The College will update these definitions in the future.

Meanwhile, please refer to the College’s website (http://www.collegeoftrades.ca) for the most accurate and up-to-date information about the College. For information on OCTAA and its regulations, please visit: http://www.collegeoftrades.ca/about/legislation-and-regulations
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## SKILL SETS

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1. **Program Definition:** Tool and Die Maker is defined as a person who,
   - reads and interprets complex engineering drawings, tooling drawings, and work-process documentation;
   - designs, builds, changes, and repairs dies, forms, cutting tools, gauges, jigs and fixtures for the manufacturing sector;
   - builds precision dies, tooling, and prototypes using conventional and numerical controlled metal-cutting and forming machines and equipment including saws, drills, grinders, lathes, mills, die presses, and EDMs;
   - performs work-in-process measuring and checking using specialized and precision tools and equipment.

TOOL AND DIE MAKER is an approved apprenticeship program for the purposes of the Apprenticeship and Certification Act, 1998 (ACA).

2. **Program Guidelines**
   - **On-The-Job Train Duration (for apprentices)**
     The Industry Committee has identified 7,280 hours as the duration generally necessary for any apprentice to become competent in the skills required. There may be individual circumstances where the duration varies from this guideline.
   - **In-School Training Duration**
     The Industry Committee has identified 720 hours of in-school training as the duration generally necessary for an apprentice to complete the in-school curriculum for this program, except where an apprentice has been exempted from any level of that curriculum.
   - **Ratio**
     The Industry Committee has identified a journeyperson-to-apprentice ratio of one journeyperson or individuals who are deemed equivalent to a journeyperson status to one apprentice as the ratio generally necessary for an apprentice to be properly trained on the job in this program. There may be individual circumstances where the ratio varies from this guideline.
2. **Program Requirements**

- **Restricted Skill Sets**
  This program does not contain any restricted skill sets as per Ontario Regulation 565/99, Restricted Skill Sets. Therefore, an individual is not required to be registered apprentice or possess certification in order to perform skills contained in the program.

- **Academic Standard**
  The Industry Committee has identified the minimum academic standard for entry to this program as completion of Grade 12 or ministry-approved equivalent.

  (See ACA Policy 102, Confirming Academic Requirements)

- **Eligibility for Exam Challenge (for Non-apprentice C of Q Applicants)**
  The challenger must:
  - provide proof of competency in all mandatory (unshaded) skills as identified in the Training Standard or Schedule of Training; and
  - demonstrate that he/she has acquired 8,000 hours of on-the-job training.

  (See ACA Policy 150, Assessing Applicants for the Certificate of Qualification)

- **Eligibility for Program Completion (for Apprentices)**
  The apprentice must:
  - achieve competency in all mandatory (unshaded) skills as identified in the Training Standard or Schedule of Training.
  - complete the in-school training as outlined in the industry and ministry-approved Curriculum Standard.

  (ACA Policy 309, Completion of an Apprenticeship Program)

- **Other Information**

- **Other Resources**
  Complete program requirements, policies, and standards can be obtained by referring to the following resources:
  - *Apprenticeship and Certification Act, 1998 (ACA)*;
  - ACA General Regulation 573/99;
  - ACA Exemption Regulation 566/99;
  - Program-specific Apprenticeship Training Standards or Schedules of Training; and
  - ACA Program and Policy Manual
• **Other Required Certification**
  N/A

• **Academic Background**
  Industry has identified relevant secondary school course(s) likely to increase an individual’s chances of success if completed prior to program entry. For details, see the document Apprenticeship Subject Pathways.
## COMPETENCY ANALYSIS PROFILE

**Tool and Die Maker – 430A**

*(All unshaded skill sets must be demonstrated/completed)*

<table>
<thead>
<tr>
<th>SKILL SETS</th>
<th>SKILLS</th>
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<tbody>
<tr>
<td><strong>PROTECT SELF AND OTHERS</strong></td>
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<tr>
<td>5265.0</td>
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<tr>
<td>5265.01</td>
<td>Identify health and safety hazards.</td>
</tr>
<tr>
<td>5265.02</td>
<td>Wear, adjust, and maintain personal protective equipment.</td>
</tr>
<tr>
<td>5265.03</td>
<td>Wear, adjust, and maintain respiratory protectors.</td>
</tr>
<tr>
<td>5265.04</td>
<td>Practice safe work habits.</td>
</tr>
<tr>
<td>5265.05</td>
<td>Follow fire procedures.</td>
</tr>
<tr>
<td>5265.06</td>
<td>Operate emergency safety equipment.</td>
</tr>
<tr>
<td>5265.07</td>
<td>Practice industrial hygiene.</td>
</tr>
<tr>
<td>5265.08</td>
<td>Practice good housekeeping in the workplace.</td>
</tr>
<tr>
<td>5265.09</td>
<td>Conduct pre-operational check of equipment.</td>
</tr>
<tr>
<td>5265.10</td>
<td>Report injuries.</td>
</tr>
<tr>
<td>5265.11</td>
<td>Follow procedures for applying first aid.</td>
</tr>
<tr>
<td>5265.12</td>
<td>Lock out mechanical equipment for repair.</td>
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<td>Handle designated substances.</td>
</tr>
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<td>5265.14</td>
<td>Operate lifting equipment.</td>
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<tr>
<td><strong>PLAN AND PREPARE FOR MACHINING JOB</strong></td>
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<td>5266.0</td>
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<tr>
<td>5266.01</td>
<td>Read and interpret engineering drawings.</td>
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<tr>
<td>5266.02</td>
<td>Perform calculations for machining operations.</td>
</tr>
<tr>
<td>5266.03</td>
<td>Read and interpret work-process documentation.</td>
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<tr>
<td>5266.04</td>
<td>Verify workpiece material.</td>
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<tr>
<td>5266.05</td>
<td>Identify and select cutting fluids.</td>
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<tr>
<td>5266.06</td>
<td>Identify and select machines.</td>
</tr>
<tr>
<td>5266.07</td>
<td>Identify and check machine controls and systems.</td>
</tr>
<tr>
<td>5266.08</td>
<td>Identify and select tooling.</td>
</tr>
<tr>
<td>5266.09</td>
<td>Identify and prepare cutting tools.</td>
</tr>
<tr>
<td>5266.10</td>
<td>Identify and select measuring instruments and checking devices.</td>
</tr>
<tr>
<td>5266.11</td>
<td>Select machine speeds and feeds.</td>
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<tr>
<td>5266.12</td>
<td>Lay out features of engineering drawings.</td>
</tr>
<tr>
<td>5266.13</td>
<td>Identify and select work-holding devices.</td>
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<tr>
<td>5266.14</td>
<td>Pick up datum/starting position.</td>
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<td>5266.15</td>
<td>Identify and select lifting and rigging equipment.</td>
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<tr>
<td>5266.16</td>
<td>Communicate with co-workers.</td>
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### TOOL AND DIE MAKER

<table>
<thead>
<tr>
<th>5267.0</th>
<th>Check straight cuts.</th>
<th>Check shapes.</th>
<th>Check threads.</th>
<th>Check holes.</th>
<th>Check tapers.</th>
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<td>Complete work documentation.</td>
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### PERFORM SAWING

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<th>Perform</th>
<th>Lay out features of engineering drawings</th>
<th>Locate and position workpiece in saw</th>
<th>Select speeds and feeds of saw</th>
<th>Install and test-run blade</th>
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### PERFORM DRILLING USING DRILL PRESS/MACHINE

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<th>Select drill tooling.</th>
<th>Identify and prepare cutting tools for drills.</th>
<th>Locate and position workpiece in drill.</th>
<th>Set up tooling in drills.</th>
<th>Select speeds and feeds of drill.</th>
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<tr>
<td>Spot-face a hole.</td>
<td>Counter-bore a hole.</td>
<td>Counter-sink a hole.</td>
<td>Maintain material identification.</td>
<td>Deburr workpiece.</td>
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<td>5270.11</td>
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<td>PERFORM MACHINE GRINDING</td>
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<td>Check condition of grinding wheel.</td>
<td>Install grinding wheel.</td>
<td>Locate and position workpiece in grinder.</td>
<td>Surface grind workpiece.</td>
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<tr>
<td>Hone holes</td>
<td>Lap workpiece</td>
<td>Grind inside and outside diameters. (ID/OD)</td>
<td>Grind tools and cutters.</td>
<td>Check ground surfaces.</td>
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<tr>
<td>Perform final inspection.</td>
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<td>5271.11</td>
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<tr>
<td>PERFORM LATHE WORK</td>
<td>Select lathe cutting tools.</td>
<td>Identify and prepare lathe cutting tools.</td>
<td>Locate and position workpiece in lathe.</td>
<td>Set up lathe cutting tools.</td>
<td>Select speeds and feeds of lathe.</td>
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<td>5272.0</td>
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<td>5272.04</td>
<td>5272.05</td>
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<tr>
<td>Take a sizing (preliminary) cut.</td>
<td>Establish a reference or starting point (datum).</td>
<td>Face a surface.</td>
<td>Turn an external diameter.</td>
<td>Drill a hole.</td>
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<tr>
<td>5272.06</td>
<td>5272.07</td>
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<tr>
<td>Bore an internal diameter.</td>
<td>Ream a hole.</td>
<td>Tap a hole.</td>
<td>Turn an internal or external thread.</td>
<td>Produce a taper.</td>
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<td>5272.11</td>
<td>5272.12</td>
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<td>5272.19</td>
<td>5270.20</td>
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<tr>
<td>Complete work documentation.</td>
<td>Move workpiece.</td>
<td>Practice good housekeeping</td>
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<td>5272.21</td>
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<td>5272.23</td>
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<tr>
<td>PERFORM MILLING</td>
<td>Select milling cutting tools.</td>
<td>Identify and prepare milling cutting tools.</td>
<td>Set-up and maintain milling adjustable support tools.</td>
<td>Set-up milling cutting tools.</td>
<td>Select speeds and feeds of mill.</td>
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<td>5273.14</td>
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<tr>
<td>Complete work documentation.</td>
<td>Practice good housekeeping.</td>
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<td>5273.16</td>
<td>5273.17</td>
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<table>
<thead>
<tr>
<th>PERFORM NC/CNC COMPUTERIZED CONTROLLED MACHINING</th>
<th>Identify and select numerically controlled machining process</th>
<th>Identify, select, and set up NC/CNC cutting tools and tool holders.</th>
<th>Identify, select, and set machine parameters.</th>
<th>Position, align, &amp; secure workpiece in NC/CNC machine.</th>
<th>Input and verify part program to NC/CNC machine controls.</th>
</tr>
</thead>
<tbody>
<tr>
<td>5274.0</td>
<td>5274.01</td>
<td>5274.02</td>
<td>5274.03</td>
<td>5274.04</td>
<td>5274.05</td>
</tr>
<tr>
<td>Verify tool sequence, tool path, and collision avoidance program.</td>
<td>Monitor NC/CNC machining process.</td>
<td>Make adjustments to tooling and offsets.</td>
<td>Maintain material identification.</td>
<td>Perform final inspection.</td>
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</tr>
<tr>
<td>5274.06</td>
<td>5274.07</td>
<td>5274.08</td>
<td>5274.09</td>
<td>5274.10</td>
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<tr>
<td>Move workpiece.</td>
<td>Complete work documentation.</td>
<td>Practice good housekeeping.</td>
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<tr>
<td>5274.11</td>
<td>5274.12</td>
<td>5274.13</td>
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</table>
## TOOL AND DIE MAKER

### PERFORM ELECTRICAL DISCHARGE MACHINING (edm)

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<thead>
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<th>Task</th>
<th>5275.0</th>
<th>5275.01</th>
<th>5275.02</th>
<th>5275.03</th>
<th>5275.04</th>
<th>5275.05</th>
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<tbody>
<tr>
<td>Identify and select EDM process.</td>
<td>5275.01</td>
<td>5275.02</td>
<td>5275.03</td>
<td>5275.04</td>
<td>5275.05</td>
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<tr>
<td>Develop EDM electrodes.</td>
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<tr>
<td>Identify, select, and set up EDM machining components.</td>
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<tr>
<td>Identify, select, and set machine parameters.</td>
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</tr>
<tr>
<td>Position, align, and secure workpiece in EDM machine.</td>
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</tr>
<tr>
<td>Cut the workpiece by EDM machine.</td>
<td>5275.06</td>
<td>5275.07</td>
<td>5275.08</td>
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</tr>
<tr>
<td>Maintain material identification.</td>
<td></td>
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<tr>
<td>Perform final inspection.</td>
<td></td>
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<tr>
<td>Move workpiece.</td>
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<tr>
<td>Complete work documentation.</td>
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<tr>
<td>Practise good housekeeping.</td>
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</tr>
</tbody>
</table>

### DEVISE AND DETAIL A PLAN FOR THE DIE OR TOOL-BUILDING PROCESS

<table>
<thead>
<tr>
<th>Task</th>
<th>5276.0</th>
<th>5276.01</th>
<th>5276.02</th>
<th>5276.03</th>
<th>5276.04</th>
<th>5276.05</th>
</tr>
</thead>
<tbody>
<tr>
<td>Verify the features of die or tool components.</td>
<td>5276.01</td>
<td>5276.02</td>
<td>5276.03</td>
<td>5276.04</td>
<td>5276.05</td>
<td></td>
</tr>
<tr>
<td>Develop and organize a die or tool-building plan.</td>
<td></td>
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</tr>
<tr>
<td>Perform die or tool-building related calculations.</td>
<td></td>
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</tr>
<tr>
<td>Assemble and verify die or tooling stock materials.</td>
<td></td>
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</tr>
<tr>
<td>Produce a detailed sketch of die or tooling components.</td>
<td></td>
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</tr>
</tbody>
</table>

### FABRICATE COMPONENTS OF DIES, TOOLS, JIGS, OR FIXTURES

<table>
<thead>
<tr>
<th>Task</th>
<th>5277.0</th>
<th>5277.01</th>
<th>5277.02</th>
<th>5277.03</th>
<th>5277.04</th>
<th>5277.05</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cut and prepare raw material.</td>
<td>5277.01</td>
<td>5277.02</td>
<td>5277.03</td>
<td>5277.04</td>
<td>5277.05</td>
<td></td>
</tr>
<tr>
<td>Block up and establish datum.</td>
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<tr>
<td>Machine components of dies, tools, jigs, or fixtures.</td>
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<tr>
<td>Heat-treat the components.</td>
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<tr>
<td>Mark the die or tooling components.</td>
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</tr>
<tr>
<td>Fabricate and assemble sub-assemblies</td>
<td>5277.06</td>
<td>5277.07</td>
<td>5277.08</td>
<td>5277.09</td>
<td>5277.10</td>
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</tr>
<tr>
<td>Final fit sub-assemblies die, or tooling components.</td>
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<tr>
<td>Inspect die or tooling fit and functions.</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Move workpiece.</td>
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</tr>
</tbody>
</table>
## FABRICATE A PROTOTYPE PIECE PART

<table>
<thead>
<tr>
<th>Task</th>
<th>Subtask 1</th>
<th>Subtask 2</th>
<th>Subtask 3</th>
<th>Subtask 4</th>
<th>Subtask 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>5278.0</td>
<td>Develop and organize a prototype building-plan</td>
<td>Produce preliminary sketches of the prototype.</td>
<td>Build tooling aids for the prototype.</td>
<td>Manufacture the prototype piece part.</td>
<td>Perform final inspection.</td>
</tr>
<tr>
<td>5278.01</td>
<td>5278.02</td>
<td>5278.03</td>
<td>5278.04</td>
<td>5278.05</td>
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</tr>
<tr>
<td>Perform final inspection.</td>
<td>Document the prototype piece part building-process.</td>
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<tr>
<td>5278.06</td>
<td>5278.07</td>
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</tr>
</tbody>
</table>

## ASSEMBLE AND FINALIZE DIES

<table>
<thead>
<tr>
<th>Task</th>
<th>Subtask 1</th>
<th>Subtask 2</th>
<th>Subtask 3</th>
<th>Subtask 4</th>
<th>Subtask 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>5279.0</td>
<td>Read and interpret die drawings and sketches.</td>
<td>Set up and operate press.</td>
<td>Spot-form the steels and tools.</td>
<td>Prepare and form an initial blank.</td>
<td>Tool-proof forming stations.</td>
</tr>
<tr>
<td>5279.01</td>
<td>5279.02</td>
<td>5279.03</td>
<td>5279.04</td>
<td>5279.05</td>
<td></td>
</tr>
<tr>
<td>Finalize the blank shape.</td>
<td>Prepare and finalize cutting steels.</td>
<td>Finalize die assembly for final piece part production.</td>
<td>Try out and trouble-shoot the die.</td>
<td>Inspect part produced by developed die.</td>
<td></td>
</tr>
<tr>
<td>5279.06</td>
<td>5279.07</td>
<td>5279.08</td>
<td>5279.09</td>
<td>5279.10</td>
<td></td>
</tr>
<tr>
<td>Final inspect die.</td>
<td>Complete work documentation.</td>
<td></td>
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<tr>
<td>5279.11</td>
<td>5279.12</td>
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</tbody>
</table>
PREFACE

This training standard was developed by the Workplace Training Branch of the Ministry of Training, Colleges, and Universities (MTCU), in partnership with the Industry Committee and in consultation with representatives from the industry. This document is intended to be used by apprentice, supervisor/trainer and sponsor/employer as a "blueprint" for training and as a prerequisite for completion and certification.

This training document becomes the apprentice’s only record of workplace training performance.

Supervisor/trainer and apprentice are required to sign off and date the skills following each successful acquisition, unless a skill is marked shaded (optional).

The care and maintenance of this training document are the joint responsibility of the apprentice and the sponsor/employer. By signing off the skill, the supervisor/trainer and the apprentice are indicating that the apprentice has demonstrated competence of the skill. This training standard has been developed specifically for documenting the apprentices acquisition of skills of the trade.
DEFINITIONS

ACA
Apprenticeship and Certification Act, 1998

Certificate of Apprenticeship (CofA)
Certification issued to individuals who have demonstrated that they have completed an apprenticeship in Ontario.

Certificate of Qualification (CofQ)
Certification issued to C of Q applicants who have achieved a passing grade on the certification exam for their trade.

Competency Analysis Profile
A document that identifies the training needs of an individual trade and details the skills/skill sets that must be demonstrated.

Competence
The ability of an individual to perform a skill repeatedly and without assistance in the workplace to the standard set out in the Training Standard or Schedule of Training.

General Performance Objective (On-the-job Skill Set)
Describes set of skills which include all performance objectives under that skill set.

Industry Committee (IC) - under the ACA and Provincial Advisory Committee (PAC) under the TQAA
Under the ACA and TQAA, the Minister may appoint a provincial committee in any trade or group of trades to advise the Minister in matters relating to the establishment and operation of apprenticeship training programs and trades qualifications.

Journeyperson or Equivalent
A person who has acquired the knowledge and skills in a trade, occupation or craft as attested to by a provincial or territorial authority.

Mandatory
Status assigned to unshaded individual skills, skill sets or general performance objective which must be signed off for the apprentice to complete their program.

Optional
Status assigned to shaded individual skills, skills sets or general performance objective for which sign-off is not required for the apprentice to complete the program.
Sign-off
Signature of the sponsor/employer of record or an individual to whom that sponsor or employer has delegated signing authority, indicating an apprentice’s achievement of competence.

Skill
Individual skill described in the Training Standard (note: does not mean the larger skill groups referred to in the Training Standard as Skill Sets, Training Units, or General Performance Objective, but the individual skills that make up those groups).

Skill Sets
Group of individual skills found in the Training Standard (may also be called Training Unit or General Performance Objective)

Skill Set Completion Form
Lists all skill sets and includes space for sign-off by sponsor/employer of record.

Sponsor/Employer
Means a person that has entered into a registered training agreement under which the person is required to ensure that an individual is provided with workplace-based training in a trade, other occupation or skill set as part of an apprenticeship program approved by the Director.

Sponsor/Employer of Record
Refers to the sponsor or employer documented as the signatory to the current training agreement or contract. In order for an sponsor/employer to be considered for the training of apprentices, they must identify that the workplace has qualified journeypersons or equivalent on site and can identify that the workplace has the tools, equipment, materials, and processes which have been identified by Provincial Advisory Committees (PACs) or Industry Committees (ICs) to be required for the trade.

Supervisor
An individual who oversees the execution of a task; oversees the actions or work of others.

Trainer
A qualified trainer in a compulsory trade is a journeyperson with a Certificate of Qualification or in a voluntary trade is an individual who is considered equivalent to a journeyperson with a Certificate of Qualification.

TQAA
Trades Qualification and Apprenticeship Act.

Training Standard
A document that has been written in concise statements, which describe how well an apprentice must perform each skill in order to become competent. In using the document, trainers will be able to ensure that the apprentice is developing skills detailed for the occupation.
IMPORTANT DIRECTIONS

Apprentice

1. All complete skills or skill sets must be signed and dated by both the apprentice and sponsor/employer when either all terms of the contract have been completed or the apprentice leaves the employ of the employer.

2. It is the responsibility of the apprentice to inform the apprenticeship staff at the local Ministry of Training, Colleges and Universities office regarding the following changes:
   - change of sponsor/employer address;
   - change of apprentice name or address;
   - transfer to a new sponsor/employer.

3. The Skill Set Completion Form must be completed and signed by the current sponsor/employer and presented to the local Apprenticeship Client Services Office at the fulfillment of all terms of a Contract of Apprenticeship/Training Agreement.

4. The apprentice completion form with the Completed and Authorized Training Standard must be presented to the local Apprenticeship Client Services Unit.

Sponsors/Employers and Supervisors/Trainers

The Training Standard identifies skills required for this trade/occupation and its related training program.

This Training Standard has been written in concise statements which describe how an apprentice must perform each skill in order to become competent. Competence means being able to perform the task to the required standard.

In using this Training Standard, supervisors/trainers will be able to ensure that the apprentice is developing the skills detailed for the trade/occupation.

Supervisors/Trainers and apprentices are required to sign off and date the skills following each successful acquisition.

Sponsors/Employers participating in this training program will be designated as the Signing Authority and are required to attest to successful achievement by signing the appropriate box included at the end of each skill set.
NOTICE OF COLLECTION OF PERSONAL INFORMATION

1. At any time during your apprenticeship training, you may be required to show this training standard to the Ministry of Training, Colleges and Universities (the Ministry). You will be required to disclose the signed Apprenticeship Completion form to the Ministry in order to complete your program. The Ministry will use your personal information to administer and finance Ontario’s apprenticeship training system, including confirming your completion and issuing your certificate of apprenticeship.

2. The Ministry will disclose information about your program completion and your certificate of apprenticeship to the Ontario College of Trades, as it is necessary for the College to carry out its responsibilities.

3. Your personal information is collected, used and disclosed by the Ministry under the authority of the Ontario College of Trades and Apprenticeship Act, 2009.

4. Questions about the collection, use and disclosure of your personal information by the Ministry may be addressed to the:

Manager, Employment Ontario Contact Centre
Ministry of Training, Colleges and Universities
33 Bloor St. E, 2nd floor, Toronto, Ontario M7A 2S3
Toll-free: 1-800-387-5656; Toronto: 416-326-5656
ROLES & RESPONSIBILITIES OF APPRENTICE, SPONSOR/EMPLOYER AND SUPERVISOR/TRAINER

Apprentice  “Apprenticeship is Learning On-the-job”

- Practice safe work habits.
- Use your apprenticeship training standard as a journal to keep track of which skills you have achieved.
- Talk over your training plan with your Training Consultant, Employer, Union, or Sponsor.
- Know what tools are required for your trade and how to use them.
- Ask questions and keep asking.
- Talk to your employer about your training needs.
- Demonstrate enthusiasm and good work habits.
- Ensure that you and your supervisor/trainer sign off skill/skill sets upon demonstration of competency.

Sponsor/Employer  “Training is an Investment”

- Demonstrate safe work habits.
- Attest to successful achievement by signing the skill/skills sets.
- Provide opportunities and time for the apprentice to learn the trade.
- Offer practical trade training experiences that cover all of the skill sets.
- Foster work ethics that support training while minimizing productivity losses.
- Set out clear expectations, then recognize or reward performance excellence.
- Involve both the apprentice and supervisor/trainer in developing the training plan.
- Use the Training Standard as a monitoring tool and part of regular performance evaluations.
- Select supervisors/trainers with good communication skills and who work well with others.
- Encourage supervisors/trainers to take upgrading courses - (e.g. Train the Trainer, Mentor Coach, etc).
- Complete the Skill Set Completion Form once the apprentice has demonstrated competency in the training.
- Ensure that the apprentice always works under the direction of or has access to a qualified supervisor/trainer.
- Vary the apprentice’s exposure to all the skills set out in the training standard.
Supervisor/Trainer

- Demonstrate safe work habits.
- Treat apprentices fairly and with respect.
- Use the Training Standard as a guide to evaluating competence in each skill area. In using the Training Standard, supervisors/trainers will be able to ensure that the apprentice is developing skills detailed for the trade/occupation.
- Review the Training Standard with the apprentice and develop a training plan.
- Respond fully to all questions.
- Be patient. Explain what is to be done then, show how it is done, and then let the apprentice demonstrate the task.
- Provide continuous feedback.
- Sign off individual skills/skill sets once the apprentice demonstrates competence in the skill.

Suggestions for Assessing the Progress of the Apprentice in the Workplace

- Use informal daily observation.
- Provide constructive feedback to build confidence.
- Allow the supervisor/trainer time to teach and demonstrate the skills.
- Take prompt action wherever problems occur.
- Conduct regular performance reviews involving the apprentice, supervisor/trainer and sponsor/employer.
- Use the Training Standard as the reference for establishing the competency of the apprentice.
## SKILL SET COMPLETION FORM

<table>
<thead>
<tr>
<th>SKILLS SETS</th>
<th>TITLE</th>
<th>SIGNING AUTHORITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>5265.0</td>
<td>PROTECT SELF AND OTHERS</td>
<td></td>
</tr>
<tr>
<td>5266.0</td>
<td>PLAN AND PREPARE FOR MACHINING JOB</td>
<td></td>
</tr>
<tr>
<td>5267.0</td>
<td>Performs work-in-process dimensional or surface verification</td>
<td></td>
</tr>
<tr>
<td>5268.0</td>
<td>PERFORM BENCHWORK</td>
<td></td>
</tr>
<tr>
<td>5269.0</td>
<td>PERFORM SAWING</td>
<td></td>
</tr>
<tr>
<td>5270.0</td>
<td>PERFORM DRILLING USING DRILL PRESS/MACHINE</td>
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</tr>
<tr>
<td>5271.0</td>
<td>PERFORM MACHINE GRINDING</td>
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<tr>
<td>5272.0</td>
<td>PERFORM LATHE WORK</td>
<td></td>
</tr>
<tr>
<td>5273.0</td>
<td>PERFORM MILLING</td>
<td></td>
</tr>
<tr>
<td>5274.0</td>
<td>PERFORM NUMERICALLY CONTROLLED (NC)/ COMPUTERIZED</td>
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<tr>
<td></td>
<td>NUMERICALLY CONTROLLED (CNC) MACHINING</td>
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<tr>
<td>5275.0</td>
<td>PERFORM ELECTRICAL DISCHARGE (EDM) MACHINING</td>
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<tr>
<td>5276.0</td>
<td>DEVISE AND DETAIL A PLAN FOR THE DIE OR TOOL-BUILDING PROCESS</td>
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<tr>
<td>5277.0</td>
<td>FABRICATES DIES, TOOLS, JOGS AND FIXTURES</td>
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<tr>
<td>5278.0</td>
<td>FABRICATE A PROTOTYPE PIECE PART</td>
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</tr>
<tr>
<td>5279.0</td>
<td>ASSEMBLE AND FINALIZE DIES</td>
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</table>
NOTE ON SHADED PERFORMANCE OBJECTIVES AND SKILLS:

- Shaded performance objectives and skill sets are optional. The shaded skills do not have to be demonstrated or signed-off for completion of the on-the-job component of the apprenticeship.
- The in-school curriculum learning outcomes will cover all of the skill sets, both shaded and unshaded.
- The Certificate of Qualification examination will test the whole of the trade and may test both shaded and unshaded performance skill sets.
5265.00  PROTECT SELF AND OTHERS

GENERAL PERFORMANCE OBJECTIVE

Protect Self and Others by: identifying health and safety hazards; wearing, adjusting, and maintaining protective clothing, equipment, and respiratory protectors; practising safe work habits, industrial hygiene, and good housekeeping; handling designated substances; following fire procedures and first aid procedures; operating safety equipment, lifting devices, and material handling equipment; reporting injuries; conducting pre-operational check of equipment; and, locking out equipment.

PERFORMANCE OBJECTIVES

SKILLS

5265.01  Identify health and safety hazards in the workplace, so that the potential for personal injury, damage to equipment or the environment is prevented, and corrective action is taken as defined in Safety Legislation or company standards/procedures and hazards are reported.

Signatures of:

<table>
<thead>
<tr>
<th>Apprentice</th>
<th>Date</th>
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<tr>
<th>Supervisor/Trainer</th>
<th>Date</th>
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5265.02  Wear, adjust, and maintain personal protective equipment including eye, ear, hand, and foot protectors to ensure correct fit and optimum protection for the wearer and the task being performed, in compliance with company standards/procedures and Safety Legislation.

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<th>Date</th>
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</table>
5265.00  PROTECT SELF AND OTHERS...cont’d

5265.03  Wear, adjust, and maintain respiratory protectors to ensure correct fit and optimum protection in compliance with company standards/procedures and Safety Legislation.

Signatures of:

__________________________________________  Date
Apprentice

__________________________________________  Date
Supervisor/Trainer

5265.04  Practise safe work habits by staying outside guards and barricades, wearing required clothing (not loose or torn), confining long hair, and removing jewellery in accordance with company standards/procedures and Safety Legislation.

Signatures of:

__________________________________________  Date
Apprentice

__________________________________________  Date
Supervisor/Trainer

5265.05  Follow fire procedures including locating and assessing the severity of the fire, taking appropriate action, suppressing minor fire, activating alarm, and reporting, in compliance with company standards/procedures and Safety Legislation.

Signatures of:

__________________________________________  Date
Apprentice

__________________________________________  Date
Supervisor/Trainer
5265.00 PROTECT SELF AND OTHERS...cont’d

5265.06 Operate emergency safety equipment including (not limited to) fire extinguishers, respirators, barrier creams, and fire blankets, ensuring that procedures are carried out in a safe and efficient manner in accordance with company standards/procedures and Safety Legislation.

Signatures of:

______________________________  Date
Apprentice

______________________________  Date
Supervisor/Trainer

5265.07 Practise industrial hygiene by wearing required clothing and using eye wash or showering to avoid contamination and injury, in compliance with company standards/procedures and Safety Legislation.

Signatures of:

______________________________  Date
Apprentice

______________________________  Date
Supervisor/Trainer

5265.08 Practise good housekeeping in the workplace by cleaning up spills or leaks, keeping work area clean and clear of obstructions, and storing tools or equipment, so that the potential for accident or injury is prevented and tools or equipment are in place and available in compliance with company standards/procedures and Safety Legislation.

Signatures of:

______________________________  Date
Apprentice

______________________________  Date
Supervisor/Trainer
5265.00 PROTECT SELF AND OTHERS...cont’d

5265.09 Conduct pre-operational check of equipment, ensuring that guards and safety devices are in place, secured, and not damaged in compliance with company standards/procedures and Safety Legislation.

Signatures of:

_____________________________    Date
Apprentice

_____________________________    Date
Supervisor/Trainer

5265.10 Report injuries to supervisor or first aid personnel promptly and clearly, ensuring that the injured person is attended to and information is reported precisely and accurately describing how incident occurred, so that future recurrence of similar accidents is prevented in compliance with company standards/procedures and Safety Legislation.

Signatures of:

_____________________________    Date
Apprentice

_____________________________    Date
Supervisor/Trainer

5265.11 Follow procedures for applying first aid to treat conditions including (not limited to) sudden illness, burns, cuts, abrasions, sprains, chemical inhalations, falls, and contaminants in eyes, so that the condition of the victim is stabilized and prepared for further first aid treatment in compliance with company standards/procedures and Safety Legislation.

Signatures of:

_____________________________    Date
Apprentice

_____________________________    Date
Supervisor/Trainer
5265.00  PROTECT SELF AND OTHERS...cont’d

5265.12  **Lock out mechanical equipment** for repair and maintenance by shutting down and tagging machine or manufacturing process to ensure that no materials can enter the equipment being repaired or maintained, no damage is caused to the machine and accidents are prevented in compliance with company standards/procedures and Safety Legislation.

**Signatures of:**

________________________________________  Date

Apprentice

________________________________________  Date

Supervisor/Trainer

5265.13  **Handle designated substances** using specified handling and storage equipment, so that the operator is protected from injury, the environment from contamination, and procedures are followed in compliance with Safety Legislation and company standards/procedures.

**Signatures of:**

________________________________________  Date

Apprentice

________________________________________  Date

Supervisor/Trainer
5265.00  PROTECT SELF AND OTHERS...cont’d

5265.14  Operate lifting equipment including (not limited to) hoists, overhead cranes, chain falls, lift pins, eye bolts, slings, cables, and chains, to remove, transport, and store materials, parts, or equipment in compliance with Safety Legislation and company standards/procedures.

Signatures of:

________________________________________  __________________________
Apprentice                                      Date

________________________________________  __________________________
Supervisor/Trainer                              Date

________________________________________  __________________________
Sponsor/Employer Name                           Sponsor/Employer Signature
5266.00 PLAN AND PREPARE FOR MACHINING JOB

GENERAL PERFORMANCE OBJECTIVE

Plan and prepare for machining job by: reading and interpreting engineering drawings; performing calculations; reading and interpreting work-process documentation; verifying workpiece material; identifying and selecting cutting fluids, machines, machine controls and systems, tooling, measuring or checking devices, work-holding devices, and lifting or rigging equipment; identifying and preparing cutting tools; selecting speeds and feeds; laying out features of the engineering drawing; picking up position from layout lines; and, communicating with co-workers.

PERFORMANCE OBJECTIVES

SKILLS

5266.01 Read and interpret engineering drawings to identify dimensions and tolerances, machine surface designations and allowances, type of workpiece material, and any other information needed to plan the machining job in accordance with company standards/procedures.

Signatures of:

Apprentice Date

Supervisor/Trainer Date

5266.02 Perform calculations for machining operations including determining speeds and feeds, calculating cutting tool positions, workpiece alignments, and dimensions to be measured and verified using both System International (S.I.) and Imperial System, so that all required specifications and parameters are correctly determined to machine the workpiece in accordance with engineering drawings and job specifications.

Signatures of:

Apprentice Date

Supervisor/Trainer Date
PLAN AND PREPARE FOR MACHINING JOB…cont’d

5266.03 Read and interpret work-process documentation to identify required machines, job operations, sequencing of job, method of machining, required set-ups, and any other information needed to plan the machining job.

Signatures of:

Apprentice ________________________ Date __________

Supervisor/Trainer ________________________ Date __________

5266.04 Verify workpiece material for correct size and type by checking colour codes, lettering, or numerical stamps, to ensure that the workpiece selected conforms to engineering drawings and job instruction sheets.

Signatures of:

Apprentice ________________________ Date __________

Supervisor/Trainer ________________________ Date __________

5266.05 Identify and select cutting fluids using manuals, charts, engineering drawings, and material safety data sheets, ensuring that the cutting fluid selected is the correct one to maximize machining without damage to workpiece, cutting tool, or machine.

Signatures of:

Apprentice ________________________ Date __________

Supervisor/Trainer ________________________ Date __________
5266.00 PLAN AND PREPARE FOR MACHINING JOB…cont’d

5266.06 **Identify and select machines** including conventional and numerically controlled saws, drills, lathes, grinders, and vertical or horizontal mills, and Electrical Discharge Machines (EDM), using information from engineering drawings and work-process documentation to ensure that machine selected is the correct one for the application and available to perform the job.

**Signatures of:**

Apprentice __________________________ Date __________________________

Supervisor/Trainer __________________________ Date __________________________

5266.07 **Identify and check machine controls and systems** including locating and identifying switches, buttons, levers, controls, and safety devices, to ensure that all controls are operational and functioning according to manufacturer's specifications and company standards/procedures.

**Signatures of:**

Apprentice __________________________ Date __________________________

Supervisor/Trainer __________________________ Date __________________________

5266.08 **Identify and select tooling** required to perform cutting by using information in engineering drawings and job instructions, to ensure that the tooling selected is the correct size and type for the application and available to perform the job.

**Signatures of:**

Apprentice __________________________ Date __________________________

Supervisor/Trainer __________________________ Date __________________________
5266.00 PLAN AND PREPARE FOR MACHINING JOB…cont’d

5266.09 Identify and prepare cutting tools by sharpening or replacing tools so that the cutting shape and angle is prepared for optimum cutting and personal safety in accordance with manufacturer's specifications, engineering drawings, and company standards/procedures.

Signatures of:

_________________________________________________________  Date
Apprentice

_________________________________________________________  Date
Supervisor/Trainer

5266.10 Identify and select measuring instruments and checking devices, ensuring that instruments and devices selected are capable of measuring to obtain the dimensions and tolerances specified in the engineering drawings, job specifications, and process layout.

Signatures of:

_________________________________________________________  Date
Apprentice

_________________________________________________________  Date
Supervisor/Trainer

5266.11 Select machine speeds and feeds using speed and feed charts and in accordance with the size, type, and hardness of workpiece materials, so that machines perform optimum cutting without damage to workpiece, cutting tools, or machines, and ensures personal safety.

Signatures of:

_________________________________________________________  Date
Apprentice

_________________________________________________________  Date
Supervisor/Trainer
5266.00 PLAN AND PREPARE FOR MACHINING JOB…cont’d

5266.12 Lay out features of engineering drawings on to the workpiece using precision measuring instruments and layout equipment including (not limited to) scribe, center punch, vernier height gauge, surface plate, combination set, and layout medium or dyes, so that the completed layout conforms to engineering drawings and job specifications.

Signatures of:

_________________________________________ Date
Apprentice

_________________________________________ Date
Supervisor/Trainer

5266.13 Identify and select work-holding devices including (not limited to) vises, clamps, jigs, chucks, face plates, centers, catch plates, steady rest, tailstocks, and mandrels, ensuring that the work-holding device selected is the correct one to safely and securely position and locate the workpiece in the machine, in accordance with Safety Legislation, job specifications, and company standards/procedures.

Signatures of:

_________________________________________ Date
Apprentice

_________________________________________ Date
Supervisor/Trainer

5266.14 Pick up datum/starting position using layout lines, tooling balls, or edge of the part and required tools including (not limited to) pointer, wiggler, indicator, and edge finder to identify and locate the datum/start position as specified in engineering drawings and job specifications.

Signatures of:

_________________________________________ Date
Apprentice

_________________________________________ Date
Supervisor/Trainer
5266.00 PLAN AND PREPARE FOR MACHINING JOB…cont’d

5266.15 Identify and select lifting and rigging equipment including (not limited to) hoists, overhead cranes, chain falls, lift pins, cables, eye bolts, and chains, ensuring that equipment is selected in compliance with Safety Legislation and company standards/procedures for the safe handling and moving of materials.

Signatures of:

__________________________________________ Date
Apprentice

__________________________________________ Date
Supervisor/Trainer

5266.16 Communicate with co-workers to identify previous job operations, availability of tools, parts, and machinery, scheduling requirements, and any other information needed to plan and prepare for the machining job, ensuring that the information communicated is clear, concise, and accurate.

Signatures of:

__________________________________________ Date
Apprentice

__________________________________________ Date
Supervisor/Trainer

_________________________ ________________________
Sponsor/Employer Name Sponsor/Employer Signature
5267.00  PERFORM WORK-IN-PROCESS DIMENSIONAL OR SURFACE VERIFICATION

GENERAL PERFORMANCE OBJECTIVE

Perform work-in-process dimensional or surface verification by: checking straight cuts, shapes, threads, holes, tapers, and hardness; maintaining material identification; deburring workpiece; checking surfaces; performing final inspection; completing work documentation.

PERFORMANCE OBJECTIVES

SKILLS

5267.01  Check straight cuts by using precision measuring instruments including (not limited to) micrometer, verniers, callipers, squares, straight edge, dial indicator, and surface comparator, to ensure that the accurate size, finish, parallelism, and squareness of straight cuts conform with engineering drawings and job specifications.

Signatures of:

Apprentice  Date

Supervisor/Trainer  Date

5267.02  Check shapes by using precision measuring instruments and checking devices including (not limited to) radius gauges, surface comparator, and verniers, to ensure that the profile and finish of the cut shape conform to engineering drawing and job specifications.

Signatures of:

Apprentice  Date

Supervisor/Trainer  Date
5267.00 PERFORM WORK-IN-PROCESS DIMENSIONAL OR SURFACE VERIFICATION…cont’d

5267.03 Check threads by using precision measuring instruments, checking devices, and various checking methods including (not limited to) 3-wire method, thread micrometer, thread gauge, and plug or ring gauges, to ensure that the accuracy of pitch, thread geometry, and size of cut threads conform to the engineering drawings and job specifications.

Signatures of:

__________________________          Date
Apprentice

__________________________          Date
Supervisor/Trainer

5267.04 Check holes by using precision measuring instruments and checking devices including (not limited to) dial indicators, bore gauges, plug gauges, telescopic gauges, surface comparators, and verniers, to ensure that the accuracy of the diameter, depth, concentricity, position, and finish of cut holes conform with engineering drawings and job specifications.

Signatures of:

__________________________          Date
Apprentice

__________________________          Date
Supervisor/Trainer

5267.05 Check tapers using precision measuring instruments and checking devices including (not limited to) taper gauge, sine bar, micrometer, and vernier to ensure that the accuracy of the angle, taper/foot, and diameter of the cut tapers conform with engineering drawings and job specifications.

Signatures of:

__________________________          Date
Apprentice

__________________________          Date
Supervisor/Trainer
5267.00 PERFORM WORK-IN-PROCESS DIMENSIONAL OR SURFACE VERIFICATION…cont’d

5267.06 Check hardness using various types of hardness testers and comparison charts to ensure that the hardness level of the workpiece materials is in accordance with engineering drawings and job specifications.

Signatures of:

_________________________  Date

Apprentice

_________________________  Date

Supervisor/Trainer

5267.07 Maintain material identification by marking or stamping workpiece and completing shop documentation, to facilitate traceability of the final product or work-in-process and to maintain inventory control in accordance with company standards/procedures.

Signatures of:

_________________________  Date

Apprentice

_________________________  Date

Supervisor/Trainer

5267.08 Deburr workpiece using files, scrapers, emery cloth, sanders, and hand or pedestal grinders, to remove excess material and to ensure safe handling in accordance with Safety Legislation, engineering drawings, and job specifications.

Signatures of:

_________________________  Date

Apprentice

_________________________  Date

Supervisor/Trainer

5267.09 Check surfaces using surface comparators to ensure that surface is finished in micro-inches or microns as specified in the engineering drawings and job specifications.

Signatures of:

_________________________  Date

Apprentice

_________________________  Date

Supervisor/Trainer
5267.00  PERFORM WORK-IN-PROCESS DIMENSIONAL OR SURFACE VERIFICATION…cont’d

5267.10  Perform final inspection using precision measuring instruments and checking devices including (not limited to) inside and outside micrometers, vernier height gauges or indicators, gauge blocks, and pin gauges to ensure that the tolerances and dimensions of the workpiece conform to the engineering drawings and job specifications.

Signatures of:

_________________________________________  Date

Apprentice

_________________________________________  Date

Supervisor/Trainer

5267.11  Complete work documentation including (not limited to) tracking sheets, sign-off sheets, inspection reports, or procedure sheets, to record the finalization of jobs and to facilitate traceability of work-in-process, ensuring that all data is recorded accurately and clearly in accordance with engineering drawings, job specifications, and company standards/procedures.

Signatures of:

_________________________________________  Date

Apprentice

_________________________________________  Date

Supervisor/Trainer

Sponsor/Employer Name  Sponsor/Employer Signature
5268.00 PERFORM BENCHWORK

GENERAL PERFORMANCE OBJECTIVE

Perform benchwork by: hand-filing; hand-sawing; hand-drilling holes; hand-tapping threaded holes; hand-reaming; chasing threads; hand-grinding; and, practising good housekeeping.

PERFORMANCE OBJECTIVES

SKILLS

5268.01 Hand-file using files including (not limited to) flat, needle, bastard, rat-tail, lathe, and half-round files, to remove excessive material so that workpiece is filed in accordance with engineering drawings and job specifications.

Signatures of:

____________________________________  Date
Apprentice

____________________________________  Date
Supervisor/Trainer

5268.02 Hand-saw using cut-off saws to cut workpiece to specified lengths in accordance with engineering drawings and job specifications.

Signatures of:

____________________________________  Date
Apprentice

____________________________________  Date
Supervisor/Trainer

5268.03 Hand-drill holes using power drill and drill bits so that the size of the drilled holes conform with engineering drawings and job specifications.

Signatures of:

____________________________________  Date
Apprentice

____________________________________  Date
Supervisor/Trainer


5268.04 **Hand-tap threaded holes using** taps, T-handle, and tapping block, so that the depth and squareness of tapped threads conform to engineering drawings and job specifications.

**Signatures of:**

Apprentice  
Date  

Supervisor/Trainer  
Date  

5268.05 **Hand-ream** using straight or spiral-fluted reamers to remove excessive material, so that the diameter and depth of reamed hole conform to engineering drawings and job specifications.

**Signatures of:**

Apprentice  
Date  

Supervisor/Trainer  
Date  

5268.06 **Chase threads** using hand taps and dies to repair or clean damaged threads, so that the threads conform with engineering drawings and job specifications.

**Signatures of:**

Apprentice  
Date  

Supervisor/Trainer  
Date  

5268.07 **Hand-grind** using pneumatic or electric hand grinders to remove excess material, so that the workpiece is ground in accordance with engineering drawings and job specifications.

**Signatures of:**

Apprentice  
Date  

Supervisor/Trainer  
Date
5268.00 PERFORM BENCHWORK…cont’d

5268.08 Practise good housekeeping in the workplace by cleaning up spills or leaks, keeping work area clean and clear of obstructions, and storing tools or equipment, so that the potential for accident or injury is prevented and tools or equipment are in place and available in compliance with company standards/procedures and Safety Legislation.

Signatures of:

__________________________________  _________________________
Apprentice                                    Date

__________________________________  _________________________
Supervisor/Trainer                           Date

Sponsor/Employer Name   Sponsor/Employer Signature
PERFORM SAWING

GENERAL PERFORMANCE OBJECTIVE

Perform sawing by: checking fused/welded blade; laying out features of the engineering drawings; locating and positioning workpiece in saw; selecting speeds and feeds; installing and test-running blade; checking first cut-off; cutting shapes with vertical bandsaw; cutting squared and angled surfaces with a power cut-off saw; maintaining material identification; deburring workpiece; performing final inspection; completing work documentation; moving workpiece; and, practising good housekeeping.

PERFORMANCE OBJECTIVES

SKILLS

5269.01 Check fused/welded blade to ensure that joined saw has a continuous cutting edge in accordance with manufacturer=s or job specifications, company standards/procedures, and Safety Legislation.

Signatures of:

Apprentice

Supervisor/Trainer

5269.02 Lay out features of engineering drawings on to the workpiece using precision measuring instruments and layout equipment including (not limited to) scriber, centre punch, vernier height gauge, surface plate, combination set, and layout medium or dyes, so that the completed layout conforms to engineering drawings and job specifications.

Signatures of:

Apprentice

Supervisor/Trainer
5269.00 PERFORM SAWING…cont’d

5269.03 Locate and position workpiece in saw to required operational clearances by setting up workholding devices including (not limited to) clamps, nesting fixtures, vises, or roller supports, so that the workpiece is aligned, secured, and stable during sawing operations in accordance with company standards/procedures and Safety Legislation.

Signatures of:

__________________________ Date
Apprentice

__________________________ Date
Supervisor/Trainer

5269.04 Select speeds and feeds of saws using speed and feed charts and in accordance with the size, type, and hardness of workpiece material, so that the saw performs optimum cutting without damage to workpiece, cutting tools, or machines, and ensures personal safety.

Signatures of:

__________________________ Date
Apprentice

__________________________ Date
Supervisor/Trainer

5269.05 Install and test-run blade to check alignments and movement, so that the blade is installed to make the required cut, prevents machine or blade damage, and ensures personal safety in accordance with company standards/procedures and Safety Legislation.

Signatures of:

__________________________ Date
Apprentice

__________________________ Date
Supervisor/Trainer
5269.06 Check first cut-off by measuring and checking a cut-off piece, to ensure that the angles, squareness, and length of the sawed piece conforms to the engineering drawings and job specifications.

Signatures of:

Apprentice Date

Supervisor/Trainer Date

5269.07 Cut shapes using a vertical bandsaw and required sawing sequences, speeds, feeds, and cutting fluids, so that the profile, size, and dimensions of the cut shapes conform to engineering drawings, job specifications, and Safety Legislation.

Signatures of:

Apprentice Date

Supervisor/Trainer Date

5269.08 Cut squared and angled surfaces using a power cut-off saw and required sawing sequences, speeds, feeds, and cutting fluids, so that the squareness, angles, and size of cut surfaces conform to engineering drawings, job specifications, and Safety Legislation.

Signatures of:

Apprentice Date

Supervisor/Trainer Date
5269.00 PERFORM SAWING…cont’d

5269.09 Maintain material identification by marking or stamping workpiece and completing shop documentation, to facilitate traceability of the final product or work-in-process and to maintain inventory control in accordance with company standards/procedures and job specifications.

Signatures of:

____________________________________  ______________________
Apprentice                                      Date

____________________________________  ______________________
Supervisor/Trainer                               Date

5269.10 Deburr workpiece using files, scrapers, emery cloth, sanders, and hand or pedestal grinders, to remove excess material and to ensure safe handling in accordance with engineering drawings, job specifications, and Safety Legislation.

Signatures of:

____________________________________  ______________________
Apprentice                                      Date

____________________________________  ______________________
Supervisor/Trainer                               Date

5269.11 Perform final inspection using precision measuring instruments and checking devices including (not limited to) inside and outside micrometers, vernier height gauges or indicators, gauge blocks, and pin gauges, to ensure that the tolerances and dimensions of the sawed workpiece conform to the engineering drawings and job specifications.

Signatures of:

____________________________________  ______________________
Apprentice                                      Date

____________________________________  ______________________
Supervisor/Trainer                               Date
5269.00 PERFORM SAWING…cont’d

5269.12 Complete work documentation including (not limited to) tracking sheets, sign-off sheets, inspection reports, or procedure sheets, to record the finalization of jobs and to facilitate traceability of work-in-process, ensuring that data is recorded accurately and clearly in accordance with engineering drawings, job specifications, and company standards/procedures.

Signatures of:

______________________________      Date
Apprentice

______________________________      Date
Supervisor/Trainer

5269.13 Move workpiece by operating lifting and rigging equipment including (not limited to) hoists, overhead cranes, chain falls, lift pins, eye bolts, slings, cables, and chains, to remove, transport, and store materials, parts, and equipment in compliance with Safety Legislation and company standards/procedures.

Signatures of:

______________________________      Date
Apprentice

______________________________      Date
Supervisor/Trainer

5269.14 Practise good housekeeping in the workplace by cleaning up spills or leaks, keeping work area clean and clear of obstructions, and storing tools or equipment so that the potential for accident or injury is prevented and tools or equipment are in place and available in compliance with company standards/procedures and Safety Legislation.

Signatures of:

______________________________      Date
Apprentice

______________________________      Date
Supervisor/Trainer

Sponsor/Employer Name ___________________________ Sponsor/Employer Signature ___________________________
5270.00 PERFORM DRILLING USING DRILL PRESS/MACHINES

GENERAL PERFORMANCE OBJECTIVE

Perform drilling using drill press/machine by: selecting drill tooling; identifying and preparing cutting tools; locating and positioning workpiece in drill; setting up tooling; selecting speeds and feeds; centre-drilling a layout punch mark; drilling, chamfering, reaming, machine-threading, spot-facing, counter-boring, and counter-sinking a hole; maintaining material identification; deburring workpiece; performing final inspection; completing work documentation; moving workpiece; practising good housekeeping.

PERFORMANCE OBJECTIVES

SKILLS

5270.01 Select drill tooling including drill bits, centre-drill, reamers, taps, counter-bores, counter-sinks, and spot-faces by using information in engineering drawings and job specifications to ensure that tooling is the correct size, shape, type, and grade for the application.

Signatures of:

Apprentice

Date

Supervisor/Trainer

Date

5270.02 Identify and prepare cutting tools for drills by sharpening or replacing tools, so that the cutting shape and angle is prepared for optimum cutting and personal safety in accordance with manufacturer’s specifications and company standards/procedures.

Signatures of:

Apprentice

Date

Supervisor/Trainer

Date
5270.00 PERFORM DRILLING USING DRILL PRESS/MACHINES…cont’d

5270.03 Locate and position workpiece in drill to required operational clearances by setting up and securing workpiece with holding devices including (not limited to) drilling vises, clamps, jigs, angle plates, and chucks, so that the workpiece is aligned, secured, and stable during drilling in accordance with job specifications and Safety Legislation.

Signatures of:

Apprentice Date

Supervisor/Trainer Date

5270.04 Set up tooling in drills to required operational alignments using holding devices including (not limited to) drill chucks, taper sleeves, and tapping heads, to ensure that tooling is in position and held securely during drilling in accordance with job specifications and Safety Legislation.

Signatures of:

Apprentice Date

Supervisor/Trainer Date

5270.05 Select speeds and feeds of drill using speed and feed charts and in accordance with the size, type, and hardness of workpiece material, so that the drill performs optimum cutting without damage to workpiece, cutting tools, or machines, and ensures personal safety.

Signatures of:

Apprentice Date

Supervisor/Trainer Date
5270.00 PERFORM DRILLING USING DRILL PRESS/MACHINES…cont’d

5270.06 Centre-drill a layout punch mark using a drill press/machine, chuck, centre-drill, and cutting fluid, so that the punch mark is drilled in accordance with engineering drawings and job specifications.

Signatures of:

Apprentice Date

Supervisor/Trainer Date

5270.07 Drill a hole using a drilling machine, drill bits, and cutting fluids, so that the size and depth of drilled hole conform to engineering drawings and job specifications.

Signatures of:

Apprentice Date

Supervisor/Trainer Date

5270.08 Chamfer a hole using a drilling machine, countersinks, and cutting fluids to break sharp edges, so that the chamfered hole conforms to engineering drawings and job specifications.

Signatures of:

Apprentice Date

Supervisor/Trainer Date

5270.09 Ream a hole using a drilling machine, reamers, and cutting fluids, so that the diameter of the reamed hole conforms to engineering drawing or job specifications.

Signatures of:

Apprentice Date

Supervisor/Trainer Date
5270.00  PERFORM DRILLING USING DRILL PRESS/MACHINES…cont’d

5270.10  Machine-thread a hole using a drilling machine, tapping heads, taps, and cutting fluids, so that the depth, size, and pitch of the threaded depth of the hole conform with engineering drawings and job specifications.

Signatures of:

Apprentice

Date

Supervisor/Trainer

Date

5270.11  Spot-face a hole using a drilling machine, spot-facing tools, and cutting fluids, so that the depth and diameter of the spot-faced hole conform to engineering drawings or job specifications.

Signatures of:

Apprentice

Date

Supervisor/Trainer

Date

5270.12  Counter-bore a hole using a drilling machine, counter-boring tools, and cutting fluids, so that the depth and diameter of the counter-bored hole conform to engineering drawings and job specifications.

Signatures of:

Apprentice

Date

Supervisor/Trainer

Date
5270.00 PERFORM DRILLING USING DRILL PRESS/MACHINES…cont’d

5270.13 **Counter-sink a hole** using a drilling machine, countersinks, and cutting fluids, so that the depth and diameter of the counter-sunk hole conform to engineering drawings and job specifications.

Signatures of:

_________________________  Date
Apprentice

_________________________  Date
Supervisor/Trainer

5270.14 **Maintain material identification** by marking or stamping workpiece and completing shop documentation, to facilitate traceability of the final product or work-in-process and to maintain inventory control in accordance with company standards/procedures and job specifications.

Signatures of:

_________________________  Date
Apprentice

_________________________  Date
Supervisor/Trainer

5270.15 **Deburr workpiece** using files, scrapers, emery cloth, sanders, and hand or pedestal grinders, to remove excess material and to ensure safe handling in accordance with engineering drawings, job specifications, and **Safety Legislation**.

Signatures of:

_________________________  Date
Apprentice

_________________________  Date
Supervisor/Trainer
5270.00 PERFORM DRILLING USING DRILL PRESS/MACHINES…cont’d

5270.16 Perform final inspection using precision measuring instruments and checking devices including (not limited to) inside and outside micrometers, vernier height gauges or indicators, gauge blocks, and pin gauges, to ensure that the tolerances and dimensions of the drilled workpiece conform to the engineering drawings and job specifications.

Signatures of:

_________________________________________  Date
Apprentice

_________________________________________  Date
Supervisor/Trainer

5270.17 Move workpiece by operating lifting and rigging equipment including hoists, overhead cranes, chain falls, lift pins, eye bolts, slings, cables, and chains, to remove, transport, and store materials, parts, or equipment in compliance with Safety Legislation and company standards.

Signatures of:

_________________________________________  Date
Apprentice

_________________________________________  Date
Supervisor/Trainer

5270.18 Practise good housekeeping in the workplace by cleaning up spills or leaks, keeping work area clean and clear of obstructions, and storing tools or equipment, so that the potential for accident or injury is prevented and tools or equipment are in place and available in compliance with company standards/procedures and Safety Legislation.

Signatures of:

_________________________________________  Date
Apprentice

_________________________________________  Date
Supervisor/Trainer
PERFORM DRILLING USING DRILL PRESS/MACHINES…cont’d

5270.19 Complete work documentation including (not limited to) tracking sheets, sign-off sheets, inspection reports, or procedure sheets to record the finalization of jobs and to facilitate traceability of work-in-process, ensuring that all data is recorded accurately and clearly in accordance with engineering drawings, job specifications, and company standards/procedures.

Signatures of:

Apprentice Date

Supervisor/Trainer Date

Sponsor/Employer Name Sponsor/Employer Signature
5271.00 PERFORM MACHINE GRINDING

GENERAL PERFORMANCE OBJECTIVE

Perform machine grinding by: selecting grinding wheels; checking condition of grinding wheel; installing grinding wheel; locating and positioning workpiece; surface grinding workpiece; honing holes; lapping workpiece; grinding inside and outside diameters; grinding tools and cutters; checking ground surfaces; performing final inspection; completing work documentation; moving workpiece; and, practising good housekeeping.

PERFORMANCE OBJECTIVES

SKILLS

5271.01 Select grinding wheel using information in engineering drawings, charts, and job specifications, to ensure that the wheel selected is the correct grade and size needed to finish, shape, and size workface in accordance with the hardness and finish of the workpiece and job specifications.

Signatures of:

Apprentice ___________________________ Date __________

Supervisor/Trainer ___________________________ Date __________

5271.02 Check condition of grinding wheel for defects, cracks, or chips, and by taking corrective action or replacing if required, to ensure personal safety and to perform optimum cutting in accordance with job specifications and Safety Legislation.

Signatures of:

Apprentice ___________________________ Date __________

Supervisor/Trainer ___________________________ Date __________
5271.00  PERFORM MACHINE GRINDING…cont’d

5271.03  **Install grinding wheel** to specified radii and tangents/angles using diamond or star-wheel dresser, to ensure personal safety and to perform optimum grinding in accordance with job specifications, Safety Legislation, and company standards/procedures.

Signatures of:

Apprentice  Date

Supervisor/Trainer  Date

5271.04  **Locate and position workpiece in grinder** to required operational clearances by setting up workholding devices including (not limited to) angle plate, magnetic holders, vises, chucks, centres, jigs, V-block, or mandrels, so that the workpiece is aligned, secured, and stable during grinding operations in accordance with job specifications and Safety Legislation.

Signatures of:

Apprentice  Date

Supervisor/Trainer  Date

5271.05  **Surface grind workpiece** so that the finish, flatness, and size of ground surfaces conform to engineering drawings and job specifications.

Signatures of:

Apprentice  Date

Supervisor/Trainer  Date
5271.00  PERFORM MACHINE GRINDING…cont’d

5271.06  **Hone holes** using a honing machine and required attachments, so that the dimension and tolerance of honed hole conforms to engineering drawings and job specifications.

Signatures of:

_____________________________  Date

Apprentice

_____________________________  Date

Supervisor/Trainer

5271.07  **Lap workpiece** by hand grinding or using a power lapping machine so that the finish and flatness of the lapped surface conforms to engineering drawings and job specifications.

Signatures of:

_____________________________  Date

Apprentice

_____________________________  Date

Supervisor/Trainer

5271.08  **Grind inside and outside diameters (ID/OD)** using machine grinders so that the dimensions and tolerances of ground ID/OD surfaces conform to engineering drawings and job specifications.

Signatures of:

_____________________________  Date

Apprentice

_____________________________  Date

Supervisor/Trainer

5271.09  **Grind tools and cutters** using pedestal, surface, or tool and cutter grinders, so that the ground cutting edge of tools or cutters conforms to tool geometry standards to ensure optimum metal removal and finish.

Signatures of:

_____________________________  Date

Apprentice

_____________________________  Date

Supervisor/Trainer
5271.00 PERFORM MACHINE GRINDING…cont’d

5271.10 Check ground surfaces using surface comparators, to ensure that the surface is finished in microinches or microns as specified in the engineering drawings and job specifications.

Signatures of:

_________________________________________ Date
Apprentice

_________________________________________ Date
Supervisor/Trainer

5271.11 Perform final inspection using precision measuring instruments and checking devices including (not limited to) inside and outside micrometers, vernier height gauges or indicators, gauge blocks, and pin gauges, to ensure that the tolerances and dimensions of the ground workpiece conform to the engineering drawings and job specifications.

Signatures of:

_________________________________________ Date
Apprentice

_________________________________________ Date
Supervisor/Trainer

5271.12 Move workpiece by operating lifting and rigging equipment including (not limited to) hoists, overhead cranes, chain falls, lift pins, eye bolts, slings, cables, or chains, to remove, transport, and store materials, parts, or equipment in compliance with Safety Legislation and company standards/procedures.

Signatures of:

_________________________________________ Date
Apprentice

_________________________________________ Date
Supervisor/Trainer
5271.00 PERFORM MACHINE GRINDING…cont’d

5271.13 Complete work documentation including (not limited to) tracking sheets, sign-off sheets, inspection reports, or procedure sheets, to record the finalization of jobs and to facilitate traceability of work-in-process, ensuring that all data is recorded accurately and clearly in accordance with engineering drawings, job specifications, and company standards/procedures.

Signatures of:

______________________________ Date
Apprentice

______________________________ Date
Supervisor/Trainer

5271.14 Practise good housekeeping in the workplace by cleaning up spills or leaks, keeping work area clean and clear of obstructions, and storing tools or equipment, so that the potential for accident or injury is prevented and tools or equipment are in place and available in compliance with company standards/procedures and Safety Legislation.

Signatures of:

______________________________ Date
Apprentice

______________________________ Date
Supervisor/Trainer

Sponsor/Employer Name Sponsor/Employer Signature
5272.00 PERFORM LATHE WORK

GENERAL PERFORMANCE OBJECTIVE

Perform lathe work by: selecting, identifying, and preparing cutting tools; locating and positioning workpiece; setting up lathe cutting tools; selecting speeds and feeds; taking a sizing (preliminary) cut; establishing a reference or starting point (datum); facing a surface; turning an external diameter; drilling, boring, reaming, and tapping a hole; turning an internal or external thread; producing a taper; knurling cylindrical surface patterns; grooving and parting-off; maintaining material identification; deburring workpiece; performing final inspection; moving workpiece; completing work documentation; and, practising good housekeeping.

PERFORMANCE OBJECTIVES

SKILLS

5272.01 Select lathe cutting tools including (not limited to) drill bits, boring, parting, threading, facing, or turning tools, by using information from engineering drawings and job instructions to ensure that the tools selected are the correct ones needed to cut the workpiece material.

Signatures of:

Apprentice Date

Supervisor/Trainer Date

5272.02 Identify and prepare lathe cutting tools by sharpening or replacing, so that the cutting shape and angle is prepared for optimum cutting and personal safety in accordance with manufacturer's specifications and company standards/procedures.

Signatures of:

Apprentice Date

Supervisor/Trainer Date
PERFORM LATHE WORK…cont’d

5272.03 Locate and position workpiece in lathe to required operational clearances by setting up and securing workholding devices including (not limited to) chucks, face plates, centres, catch plates, steady rest, or tail stock, so that the workpiece is aligned, secured, and stable during machining in accordance with job specifications, Safety Legislation, and engineering drawings.

Signatures of:

Apprentice Date

Supervisor/Trainer Date

5272.04 Set up lathe cutting tools to required operational alignments using tool posts and tail stocks, to ensure that tools are in position and held securely during machining in accordance with job specifications.

Signatures of:

Apprentice Date

Supervisor/Trainer Date

5272.05 Select speeds and feeds of lathe using speed and feed charts and in accordance with the size, type, and hardness of workpiece material, so that the lathe performs optimum cutting without damage to workpiece, cutting tools, or machine and ensures personal safety in accordance with job specifications.

Signatures of:

Apprentice Date

Supervisor/Trainer Date
5272.00 PERFORM LATHE WORK…cont’d

5272.06 Take a sizing (preliminary) cut to determine reference workface and to check speeds and feeds to ensure that lathe is set up in accordance with engineering drawings and job specifications.

Signatures of:

_________________________________________   Date
Apprentice

_________________________________________   Date
Supervisor/Trainer

5272.07 Establish a reference or starting point (datum) by zeroing out machine and ensuring that the datum is correctly located in accordance with job specifications, engineering drawings, and company standards/procedures.

Signatures of:

_________________________________________   Date
Apprentice

_________________________________________   Date
Supervisor/Trainer

5272.08 Face a surface using a lathe and single-point tool bit and by measuring or checking with vernier, straight edge, or micrometer, so that the surface flatness and finished edge conform to engineering drawings and job specifications.

Signatures of:

_________________________________________   Date
Apprentice

_________________________________________   Date
Supervisor/Trainer
5272.00  **PERFORM LATHE WORK…cont’d**

5272.09  **Turn an external diameter** using a lathe and single-point tool and by measuring or checking with a vernier or micrometer, so that the turned diameter conforms to engineering drawings and job specifications.

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5272.10  **Drill a hole** using a lathe, centre-drill, drills, and tailstock, so that the diameter and depth of the drilled hole conform to engineering drawings and job specifications.

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5272.11  **Bore an internal diameter** using a lathe and boring bars mounted in a toolpost, so that the close-toleranced internal diameters conform to engineering drawings and job specifications.

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5272.00 PERFORM LATHE WORK…cont’d

5272.12 **Ream a hole** using a lathe, centre-drill, drills, reamers, and tail-stock, and by measuring or checking with vernier, micrometer, and gauges, so that the depth and diameter of the reamed hole conform to engineering drawings and job specifications.

**Signatures of:**

________________________________________________________________________
Apprentice  Date

________________________________________________________________________
Supervisor/Trainer  Date

5272.13 **Tap a hole** using on lathe, taps, tapping head, and tailstock, so that the depth, diameter, and thread pitch of the tapped hole conform to engineering drawings and job specifications.

**Signatures of:**

________________________________________________________________________
Apprentice  Date

________________________________________________________________________
Supervisor/Trainer  Date

5272.14 **Turn an internal or external thread** using a lathe and single-point tool bit and by measuring or checking with thread micrometers and thread plug gauge (go-no-go), so that the pitch, geometrical form, and dimensional tolerance of the turned thread conform to engineering drawings and thread standards.

**Signatures of:**

________________________________________________________________________
Apprentice  Date

________________________________________________________________________
Supervisor/Trainer  Date
5272.00  **PERFORM LATHE WORK**…cont’d

5272.15  **Produce a taper** using a lathe, offset tail stock, taper-turning attachment, and compound rest, and by measuring or checking with protractors, micrometers, vernier height gauges, or templates, so that the size and angle of turned taper conform to engineering drawings and job specifications.

**Signatures of:**

__________________________________  Date

Apprentice

__________________________________  Date

Supervisor/Trainer

5272.16  **Knurl cylindrical surface patterns** using a lathe and knurling tools, so that the diameter, form, depth, and finish of knurled surface patterns conform to engineering drawings and job specifications.

**Signatures of:**

__________________________________  Date

Apprentice

__________________________________  Date

Supervisor/Trainer

5272.17  **Groove and part-off** using a lathe and grooving or parting tools, so that the width, length, depth, and square of cut-offs conform to engineering drawings and job specifications.

**Signatures of:**

__________________________________  Date

Apprentice

__________________________________  Date

Supervisor/Trainer
5272.00 PERFORM LATHE WORK…cont’d

5272.18 Maintain material identification by marking or stamping workpiece and completing shop documentation, to facilitate traceability of the final product or work-in-process and to maintain inventory control in accordance with company standards/procedures.

Signatures of:

Apprentice Date
Supervisor/Trainer Date

5272.19 Deburr workpiece using files, scrapers, emery cloth, sanders, and hand or pedestal grinders, to remove excess material and to ensure safe handling in accordance with engineering drawings, job specifications, and Safety Legislation.

Signatures of:

Apprentice Date
Supervisor/Trainer Date

5272.20 Perform final inspection using precision measuring instruments and checking devices including (not limited to) inside and outside micrometers, vernier height gauges or indicators, gauge blocks, and pin gauges, to ensure that the tolerances and dimensions of the completed workpiece conform to the engineering drawings and job specifications.

Signatures of:

Apprentice Date
Supervisor/Trainer Date
PERFORM LATHE WORK…cont’d

Complete work documentation including (not limited to) tracking sheets, sign-off sheets, inspection reports, or procedure sheets to record the finalization of jobs and to facilitate traceability of work-in-process, ensuring that all data is recorded accurately and clearly in accordance with engineering drawings, job specifications, and company standards/procedures.

Signatures of:

_________________________________________ Date
Apprentice

_________________________________________ Date
Supervisor/Trainer

Move workpiece by operating lifting and rigging equipment including (including) hoists, overhead cranes, chain falls, lift pins, eye bolts, slings, cables, and chains, to remove, transport, and store materials, parts, or equipment in compliance with Safety Legislation and company standards/procedures.

Signatures of:

_________________________________________ Date
Apprentice

_________________________________________ Date
Supervisor/Trainer

Practise good housekeeping in the workplace by cleaning up spills or leaks, keeping work area clean and clear of obstructions, and storing tools or equipment so that the potential for accident or injury is prevented and tools or equipment are in place and available in compliance with company standards/procedures and Safety Legislation.

Signatures of:

_________________________________________ Date
Apprentice

_________________________________________ Date
Supervisor/Trainer

Sponsor/Employer Name

_________________________________________
Sponsor/Employer Signature
5273.00 PERFORM MILLING

GENERAL PERFORMANCE OBJECTIVE

Perform milling by: selecting milling cutter tools; identifying and preparing cutting tools; setting up and maintaining adjustable support tools; setting up milling cutting tools; selecting speeds and feeds; performing fly-cutting; face-milling; machining steps, cut-outs, angles, and open slots; machining a pocket or slot; machining and boring holes; maintaining material identification; deburring workpiece; performing final inspection; moving workpiece; completing work documentation, and, practising good housekeeping.

PERFORMANCE OBJECTIVES

SKILLS

5273.01 Select milling cutting tools including (not limited to) end mills, face mills, shell cutters, slot drills, boring bars, slitting saws, and boring head, by using information from engineering drawings and job instructions to ensure that the tools selected are the correct ones needed to mill the workpiece to specifications.

Signatures of:

Apprentice Date

Supervisor/Trainer Date

5273.02 Identify and prepare milling cutting tools by sharpening or replacing tools so that the cutting shape and angle is prepared for optimum cutting and personal safety, in accordance with manufacturer's specifications and company standards/procedures.

Signatures of:

Apprentice Date

Supervisor/Trainer Date
5273.00 PERFORM MILLING…cont’d

5273.03 Set-up and maintain milling adjustable support tools including (not limited to) indexing heads, vises, angle plates, sine bars, and tables, ensuring that the support tool is the correct one for the application and the workpiece is located and secured during machining in accordance with job specifications and Safety Legislation.

Signatures of:

________________________________________  ______________________
Apprentice                             Date

________________________________________  ______________________
Supervisor/Trainer                     Date

5273.04 Set up milling cutting tools to required operational alignments using arbors, collets, and drill chucks, to ensure that the tools are in position and held securely during machining in accordance with job specifications and manufacturer’s specifications.

Signatures of:

________________________________________  ______________________
Apprentice                             Date

________________________________________  ______________________
Supervisor/Trainer                     Date

5273.05 Select speeds and feeds of mill using speed and feed charts and in accordance with size, type, and hardness of workpiece material, so that the mill performs optimum cutting without damage to the workpiece, cutting tools, or machine and ensures personal safety.

Signatures of:

________________________________________  ______________________
Apprentice                             Date

________________________________________  ______________________
Supervisor/Trainer                     Date
5273.00  PERFORM MILLING…cont’d

5273.06  **Perform fly-cutting** using a milling machine, single-point tool bit, and required cutting fluid, so that the size, shape, squareness, and flatness of the fly-cut workpiece conform to engineering drawings and job specifications.

Signatures of:

[Signature]  [Date]

[Signature]  [Date]

5273.07  **Face-mill** using a milling machine, multi-point tool bit, face mill, and required cutting fluids, so that the size, shape, squareness, and flatness of the faced workpiece conform to engineering drawings and job specifications.

Signatures of:

[Signature]  [Date]

[Signature]  [Date]

5273.08  **Machine steps, cut-outs, angles, and open slots** using a milling machine, end mill, and required cutting fluid, so that the size, shape, and angle of the end-milled workpiece conform to engineering drawings and job specifications.

Signatures of:

[Signature]  [Date]

[Signature]  [Date]
PERFORM MILLING…cont’d

5273.09 Machine a pocket or slot using a milling machine, slot drill, center cutting end mill, and required cutting fluid, so that the size, shape, and angle of milled pockets or slots conform to engineering drawings and job specifications.

Signatures of:

Apprentice                  Date

Supervisor/Trainer          Date

5273.10 Machine a hole using a milling machine, drill bits, reamers, slot drills, and required cutting fluid, so that the diameter, depth, and tolerance of the milled hole conform to engineering drawings and job specifications.

Signatures of:

Apprentice                  Date

Supervisor/Trainer          Date

5273.11 Bore holes using a milling machine, boring bar, boring head, and required cutting fluid, so that the diameter, finish, depth and location of the bored hole conform to engineering drawings and job specifications.

Signatures of:

Apprentice                  Date

Supervisor/Trainer          Date
PERFORM MILLING…cont’d

5273.12 Maintain material identification by marking or stamping workpiece and completing shop documentation, to facilitate traceability of the final product or work-in-process and to maintain inventory control in accordance with company standards/procedures.

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5273.13 Deburr workpiece using files, scrapers, emery cloth, sanders, and hand or pedestal grinders, to remove excess material and to ensure safe handling in accordance with engineering drawings, job specifications, and Safety Legislation.

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5273.14 Perform final inspection using precision measuring and checking devices instruments including (not limited to) inside and outside micrometers, vernier height gauges or indicators, gauge blocks, and pin gauges, to ensure that the tolerances and dimensions of the milled workpiece conform to the engineering drawings and job specifications.

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TOOL AND DIE MAKER

5273.00 PERFORM MILLING…cont’d

5273.15 Move workpiece by operating lifting and rigging equipment including (not limited to) hoists, overhead cranes, chain falls, lift pins, eye bolts, slings, cables, and chains to remove, transport, and store materials, parts, and equipment in compliance with Safety Legislation and company standards/procedures.

Signatures of:

________________________________________  __________
Apprentice                                      Date

________________________________________  __________
Supervisor/Trainer                              Date

5273.16 Complete work documentation including (not limited to) tracking sheets, sign-off sheets, inspection reports or procedure sheets to record the finalization of jobs and to facilitate traceability of work-in-process, ensuring that all data is recorded accurately and clearly in accordance with engineering drawings, job specifications, and company standards/procedures.

Signatures of:

________________________________________  __________
Apprentice                                      Date

________________________________________  __________
Supervisor/Trainer                              Date

5273.17 Practise good housekeeping in the workplace by cleaning up spills or leaks, keeping work area clean and clear of obstructions, and storing tools or equipment so that the potential for accident or injury is prevented and tools or equipment are in place and available, in compliance with company standards/procedures and Safety Legislation.

Signatures of:

________________________________________  __________
Apprentice                                      Date

________________________________________  __________
Supervisor/Trainer                              Date

Sponsor/Employer Name ________________________  Sponsor/Employer Signature ________________________

Ontario College of Trades ©
5274.00 PERFORM NUMERICALLY CONTROLLED (NC) / COMPUTERIZED NUMERICALLY CONTROLLED (CNC) MACHINING

GENERAL PERFORMANCE OBJECTIVE

Perform NC/CNC machining by: identifying and selecting numerically controlled process; identifying, selecting, and setting up NC/CNC cutting tools and tool holders; identifying, selecting, and setting machine parameters; positioning, aligning, and securing workpiece in NC/CNC machine; inputting and verifying part program to the NC/CNC machine control; verifying tool sequence, tool path, and collision avoidance program; monitoring NC/CNC machining process; making adjustments to tooling and offsets; maintaining material identification; performing final inspection; moving workpiece; completing work documentation; and, practising good housekeeping.

PERFORMANCE OBJECTIVES

SKILLS

5274.01 Identify and select numerically controlled machining process including Numerically Controlled (NC) and Computerized Numerically Controlled (CNC) machines, using information from the engineering drawings and job specifications to ensure that machining process selected is the correct one to make the parts or components.

Signatures of:

______________________________  Date

Apprentice

______________________________  Date

Supervisor/Trainer

5274.02 Identify, select, and set up NC/CNC cutting tools and tool holders including tool holders, end and face mills, carbide insert tools, centre-drill, drill, taps, reamers, counter bores, and boring head, to pre-determined reference points, by using information from the engineering drawings, prepared sequence sheet, and tool lists to ensure that tools and tooling selected are the correct ones to machine-cut the workpiece efficiently and safely.

Signatures of:

______________________________  Date

Apprentice

______________________________  Date

Supervisor/Trainer
PERFORM NUMERICALLY CONTROLLED (NC) / COMPUTERIZED NUMERICALLY CONTROLLED (CNC) MACHINING…cont’d

5274.03 Identify, select and set machine parameters including spindle feeds, table feeds, and power settings using speed and feed charts and according to the type, size, grade, and hardness of material to be cut, so that the workpiece is machined efficiently and safely without damage to tooling, machine, or workpiece and ensures personal safety, in accordance with CAD data, job specifications, and engineering drawings.

Signatures of:

Apprentice ___________________________ Date __________

Supervisor/Trainer ___________________________ Date __________

5274.04 Position, align, and secure workpiece in NC/CNC machine to specified datums and required alignments, using devices, chucks, face plates, collets, vises, clamps, stops, and fixtures, to locate and position the workpiece, avoid collisions, and ensure maximum stability during machining in accordance with job specifications and Safety Legislation.

Signatures of:

Apprentice ___________________________ Date __________

Supervisor/Trainer ___________________________ Date __________

5274.05 Input and verify part program to the NC/CNC machine control by: performing a dry run; taking a test cut; interrupting machining; measuring and checking dimensions; making adjustments to machine feeds, speeds, and offsets; editing the program; taking a final cut; and, performing an inspection prior to the production run; to ensure that the dimensions, shape, and tolerances of the machined part conform to the CAD data, engineering drawings, and job specifications.

Signatures of:

Apprentice ___________________________ Date __________

Supervisor/Trainer ___________________________ Date __________
5274.00 PERFORM NUMERICALLY CONTROLLED (NC) / COMPUTERIZED NUMERICALLY CONTROLLED (CNC) MACHINING…cont’d

5274.06 Verify tool sequence, tool path, and collision avoidance program, by performing a dry run and editing program as required, to ensure that workpiece is machined in accordance with CAD data, engineering drawings and job specifications.

Signatures of:

____________________________________  Date
Apprentice

____________________________________  Date
Supervisor/Trainer

5274.07 Monitor NC/CNC machining process by interrupting machining, measuring or checking dimensions, and making adjustments to machine feeds, speeds, and offsets, so that the dimensions, shape, and tolerances of the machined workpiece are maintained during machining in conformance with engineering drawings, CAD data, and job specifications.

Signatures of:

____________________________________  Date
Apprentice

____________________________________  Date
Supervisor/Trainer

5274.08 Make adjustments to tooling and offsets so that the displayed or modified offsets and tooling conform with CAD data, engineering drawings, and job specifications.

Signatures of:

____________________________________  Date
Apprentice

____________________________________  Date
Supervisor/Trainer
5274.00 PERFORM NUMERICALLY CONTROLLED (NC) / COMPUTERIZED NUMERICALLY CONTROLLED (CNC) MACHINING…cont’d

5274.09 Maintain material identification by marking or stamping workpiece and completing shop documentation, to facilitate traceability of the final product or work-in-process and to maintain inventory control in accordance with company standards/procedures.

Signatures of:

__________________________________________ Date

Apprentice                             Date

__________________________________________

Supervisor/Trainer                     Date

5274.10 Perform final inspection using precision measuring and checking devices instruments including (not limited to) inside and outside micrometers, vernier height gauges or indicators, gauge blocks, and pin gauges, to ensure that the tolerances and dimensions of the machined workpiece conform to the engineering drawings and job specifications.

Signatures of:

__________________________________________ Date

Apprentice                             Date

__________________________________________

Supervisor/Trainer                     Date

5274.11 Move workpiece by operating lifting and rigging equipment including (not limited to) hoists, overhead cranes, chain falls, lift pins, eye bolts, slings, cables, and chains, to remove, transport, and store materials, parts, and equipment in compliance with Safety Legislation and company standards/procedures.

Signatures of:

__________________________________________ Date

Apprentice                             Date

__________________________________________

Supervisor/Trainer                     Date
5274.00 PERFORM NUMERICALLY CONTROLLED (NC) / COMPUTERIZEDNUMERICALLY CONTROLLED (CNC) MACHINING…cont’d

5274.12 **Complete work documentation** including (not limited to) data sheets, tracking sheets, sign-off sheets, inspection reports, or procedure sheets, to record the finalization of jobs and to facilitate traceability of work-in-process, ensuring that all data is recorded accurately and clearly in accordance with engineering drawings, job specifications, and company standards/procedures.

Signatures of:

_________________________  _______________________
Apprentice                      Date

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Supervisor/Trainer               Date

5274.13 **Practise good housekeeping** in the workplace by cleaning up spills or leaks, keeping work area clean and clear of obstructions, and storing tools or equipment, so that the potential for accident or injury is prevented and tools or equipment are in place and available in compliance with company standards/procedures and Safety Legislation.

Signatures of:

_________________________  _______________________
Apprentice                      Date

_________________________  _______________________
Supervisor/Trainer               Date

_________________________  _______________________
Sponsor/Employer Name           Sponsor/Employer Signature
PERFORM ELECTRICAL DISCHARGE MACHINING (EDM)

GENERAL PERFORMANCE OBJECTIVE

Perform EDM machining by: identifying and selecting EDM machining process; developing electrodes; identifying, selecting, and setting up EDM machining components, and machine parameters; positioning, aligning, and securing workpiece in EDM machine; cutting the workpiece; maintaining material identification; performing final inspection; moving workpiece; completing work documentation; and, practising good housekeeping.

PERFORMANCE OBJECTIVES

SKILLS

5275.01 Identify and select Electrical Discharge Machining (EDM) process using information from CAD data, engineering drawings and job specifications to ensure that process selected is the correct one to cut parts or components.

Signatures of:

__________________________  Date

Apprentice

__________________________  Date

Supervisor/Trainer

5275.02 Develop EDM electrodes by selecting the correct material according to the workpiece material, complexity and quantity of electrodes, surface finish, tolerances, flushing or removal rates, engineering drawings, and job specifications.

Signatures of:

__________________________  Date

Apprentice

__________________________  Date

Supervisor/Trainer
5275.00 PERFORM ELECTRICAL DISCHARGE MACHINING (EDM)...cont’d

5275.03 Identify, select, and set up EDM machining components including cutting tools, tool holders, EDM wire and guides, to pre-determined reference points by using information from the engineering drawings, prepared sequence sheet, and tool lists, to ensure that tools and tooling selected are the correct ones to cut the workpiece efficiently and safely.

Signatures of:

________________________________________  __________________________
Apprentice                                      Date

________________________________________  __________________________
Supervisor/Trainer                              Date

5275.04 Identify, select and set machine parameters including rotations, flushing rates, and power settings using speed and feed charts and according to the type, size, grade, and hardness of material to be cut, so that the workpiece is machined efficiently and safely without damage to tooling, machine, or workpiece and ensures personal safety in accordance with engineering drawings and job specifications.

Signatures of:

________________________________________  __________________________
Apprentice                                      Date

________________________________________  __________________________
Supervisor/Trainer                              Date

5275.05 Position, align, and secure workpiece in EDM machine to specified datums and required alignments using workholding devices to locate and position the workpiece and ensure maximum stability during machining, in accordance with engineering drawings and job specifications.

Signatures of:

________________________________________  __________________________
Apprentice                                      Date

________________________________________  __________________________
Supervisor/Trainer                              Date

Sponsor/Employer Name  __________________________
Sponsor/Employer Signature
5275.00 PERFORM ELECTRICAL DISCHARGE MACHINING (EDM)…cont’d

5275.06 Cut the workpiece by electrical discharge machining and measuring or checking using verniers, depth micrometer, and indicators, so that the completed shape, contour, and size of the machined workpiece conforms to engineering drawings and job specifications.

Signatures of:

Apprentice

Date

Supervisor/Trainer

Date

5275.07 Maintain material identification by marking or stamping workpiece and completing shop documentation, to facilitate traceability of the final product or work-in-process and to maintain inventory control in accordance with company standards/procedures and job specifications.

Signatures of:

Apprentice

Date

Supervisor/Trainer

Date

5275.08 Perform final inspection using precision measuring and checking devices instruments including (not limited to) inside and outside micrometers, vernier height gauges or indicators, gauge blocks, and pin gauges, to ensure that the tolerances and dimensions of the completed workpiece conform to the engineering drawings and job specifications.

Signatures of:

Apprentice

Date

Supervisor/Trainer

Date
5275.00  PERFORM ELECTRICAL DISCHARGE MACHINING (EDM)…cont’d

5275.09  **Move workpiece** by operating lifting and rigging equipment including (not limited to) hoists, overhead cranes, chain falls, lift pins, eye bolts, slings, cables, and chains, to remove, transport, and store materials, parts, or equipment in compliance with Safety Legislation and company standards/procedures.

Signatures of:

_________________________________________  Date

Apprentice

_________________________________________  Date

Supervisor/Trainer

5275.10  **Complete work documentation** including (not limited to) tracking sheets, sign-off sheets, inspection reports, or procedure sheets, to record the finalization of jobs and to facilitate traceability of work-in-process, ensuring that all data is recorded accurately and clearly in accordance with engineering drawings, job specifications, and company standards/procedures.

Signatures of:

_________________________________________  Date

Apprentice

_________________________________________  Date

Supervisor/Trainer

5275.11  **Practise good housekeeping** in the workplace by cleaning up spills or leaks, keeping work area clean and clear of obstructions, and storing tools or equipment so that the potential for accident or injury is prevented and tools or equipment are in place and available in compliance with company standards/procedures and Safety Legislation.

Signatures of:

_________________________________________  Date

Apprentice

_________________________________________  Date

Supervisor/Trainer

Sponsor/Employer Name  Sponsor/Employer Signature
5276.00  DEVISE AND DETAIL A PLAN FOR THE DIE OR TOOL-BUILDING PROCESS

GENERAL PERFORMANCE OBJECTIVE

Devise and detail a plan for the die or tool-building process by: verifying the features of die or tool components; developing and organizing a die or tool-building plan; performing die or tool-building related calculations; assembling and verifying die or tooling stock materials; producing a detailed sketch of die or tooling components.

PERFORMANCE OBJECTIVES

SKILLS

5276.01  Verify the features of die or tool components by reading bill of materials, engineering drawings, component prints, assembly, die, or part drawings to correctly identify: tolerances; sizes; diameters; revision level; projection and section views; pick-up datum point; component shapes; number of stations; number of working components; material specifications; thickness and type of steel; assembly process; number of functions; and, quantity and type of parts, tools, and dies; ensuring that all required component features are checked and identified.

Signatures of:

________________________                  Date

Apprentice                          Date

________________________                  Date

Supervisor/Trainer

5276.02  Organize the die or tool-building plan to identify and document: types of machines and tools; job operations; sequencing of jobs; machining processes; required fixtures and tooling; and, assembly and fabrication sequences or processes; so that all features of the die or tool-building process conform to the engineering drawings, scheduled target dates, bill of materials, and job specifications.

Signatures of:

________________________                  Date

Apprentice                          Date

________________________                  Date

Supervisor/Trainer
5276.00 DEVI SE AND DETAIL A PLAN FOR THE DIE OR TOOL-BUILDING PROCESS…cont’d

5276.03 Perform die or tool-building related calculations using conversion tables/charts, material and product-specifications tables/charts, and occupational graphs, to correctly identify clearances, tolerances, and variances of material contraction or expansion, so that all die or tooling clearances, dimensions, tolerances, size, and shapes are accurately determined and documented in accordance with engineering drawings, job specifications, die drawings, and bill of materials.

Signatures of:

Apprentice Date

Supervisor/Trainer Date

5276.04 Assemble and verify die or tooling stock materials for surface condition, hardening ability, heat-treat response, type, grade, and dimensions by checking colour codes, lettering, numerical stamps, charts, and stock lists, to ensure that the workpiece materials are the correct ones to build the die or tooling as specified in the engineering drawings, bill of materials, and job specifications.

Signatures of:

Apprentice Date

Supervisor/Trainer Date

5276.05 Produce a detailed sketch of die or tooling components using engineering drawings, die, or part drawings, so that the die or tooling components and assemblies are correctly identified and sketched for shape, dimensions, tolerances, finishes, and assembly interrelationship and processes.

Signatures of:

Apprentice Date

Supervisor/Trainer Date

Sponsor/Employer Name Sponsor/Employer Signature
5277.00 FABRICATE COMPONENTS OF DIES, TOOLS, JIGS, OR FIXTURES

GENERAL PERFORMANCE OBJECTIVE

Fabricate components of dies, tools, jigs, or fixtures by: cutting and preparing raw material; blocking up and establishing datum; machining components of dies, tools, jigs, and fixtures; heat-treating the components; marking the components; fabricating and assembling sub-assemblies; final fitting sub-assemblies, dies, and tool components; inspecting the die or tooling fit and functions; moving workpiece; and, completing work documentation.

PERFORMANCE OBJECTIVES

SKILLS

5277.01 Cut and prepare raw material to specified lengths and allowances by machining using a bandsaw or cut-off wheels and by measuring or checking dimensions, so that the rough-machined part conforms to engineering drawings and job specifications.

Signatures of:

_________________________  Date
Apprentice

_________________________  Date
Supervisor/Trainer

5277.02 Block up and establish datum on a workpiece by measuring or checking with micrometers, verniers, and height gauges and by machining using mills or lathes, so that the datum faces are identified and the height, width, squareness, and grinding allowances of the blocked-up workpiece conform to the engineering drawings and job specifications.

Signatures of:

_________________________  Date
Apprentice

_________________________  Date
Supervisor/Trainer


5277.00 FABRICATE COMPONENTS OF DIES, TOOLS, JIGS, OR FIXTURES…cont’d

5277.03 Machine components of dies, tools, jigs, or fixtures using pre-determined machining processes and by measuring or checking using gauge blocks, micrometers, verniers, height gauges, and dial test indicators, so that the dimensions, shapes, tolerances, and surface finish of the machined components conform to the engineering drawings and job specifications.

Signatures of:

_________________________________________ Date

Apprentice

_________________________________________ Date

Supervisor/Trainer

5277.04 Heat-treat the components by following heat-treating processes and procedures, so that the components are tempered and hardened as required in the engineering drawings and job specifications.

Signatures of:

_________________________________________ Date

Apprentice

_________________________________________ Date

Supervisor/Trainer

5277.05 Mark the die or tooling components using stamps, etching, or engraving tools by marking item number, hardness factor, and type of material, to facilitate traceability of components in accordance with company standards/procedures and job specifications.

Signatures of:

_________________________________________ Date

Apprentice

_________________________________________ Date

Supervisor/Trainer
5277.00 FABRICATE COMPONENTS OF DIES, TOOLS, JIGS, OR FIXTURES…cont’d

5277.06 Fabricate and assemble sub-assemblies by fastening, dowelling, fitting, and soldering, so that the assembled sub-assemblies are fabricated, aligned, mated, and assembled in accordance with the engineering drawings and job specifications.

Signatures of:

Apprentice Date

Supervisor/Trainer Date

5277.07 Final fit sub-assemblies, die, or tooling components by fastening, dowelling, fitting, and spot joining, so that the final-assembled workpieces are aligned, mated, and fabricated as specified in the engineering drawings and job specifications.

Signatures of:

Apprentice Date

Supervisor/Trainer Date

5277.08 Inspect die or tooling fit and functions by trying out die or tooling and checking the components for failure, wear, or defects, to ensure that the fit and functionality of the dies or tooling conform to engineering drawings and job specifications.

Signatures of:

Apprentice Date

Supervisor/Trainer Date
5277.00  **FABRICATE COMPONENTS OF DIES, TOOLS, JIGS, OR FIXTURES**…cont’d

5277.09  **Move workpiece** by operating lifting and rigging equipment including (not limited to) hoists, overhead cranes, chain falls, lift pins, eye bolts, slings, cables, and chains, to remove, transport, and store materials, parts, and equipment in compliance with Safety Legislation and company standards/procedures.

Signatures of:

_________________________   ____________
Apprentice                  Date

_________________________   ____________
Supervisor/Trainer          Date

5277.10  **Complete work documentation** including (not limited to) tracking sheets, sign-off sheets, inspection reports, or procedure sheets, to record the finalization of jobs and to facilitate traceability of work-in-process, ensuring that all data is recorded accurately and clearly in accordance with engineering drawings, job specifications, and company standards/procedures.

Signatures of:

_________________________   ____________
Apprentice                  Date

_________________________   ____________
Supervisor/Trainer          Date

_________________________   __________________
Sponsor/Employer Name       Sponsor/Employer Signature
FABRICATE A PROTOTYPE PIECE PART

GENERAL PERFORMANCE OBJECTIVE

Fabricate a prototype piece part by: developing and organizing a prototype building-plan; producing preliminary sketches of the prototype components; building tooling aids for the prototype; manufacturing a prototype piece part; performing final inspection; documenting the prototype piece part building-process.

PERFORMANCE OBJECTIVES

SKILLS

5278.01 Develop and organize a prototype building-plan to identify: types of machines and tools; job operations; sequencing of jobs; machining processes; required fixtures, tooling and tooling aids, assembly and fabrication processes; and, sequencing of processes; ensuring that all features of the prototype building process are clearly identified, documented, and conform to the engineering drawings, job specifications, and scheduled target dates.

Signatures of:

Apprentice Date

Supervisor/Trainer Date

5278.02 Produce preliminary sketches of the prototype using bill of materials, component catalogues, and engineering drawings, so that the prototype components and assemblies are correctly identified and sketched for shape, dimensions, functions, tolerances, and assembly interrelationship and process.

Signatures of:

Apprentice Date

Supervisor/Trainer Date
5278.00  FABRICATE A PROTOTYPE PIECE PART…cont’d

5278.03  Build tooling aids for the prototype using predetermined machining processes and by measuring or checking, so that the size, shape, and finish of the tooling aids are accurately produced to assist in the prototype-building process in accordance with prepared sketches, engineering drawings, and job specifications.

Signatures of:

_________________________  Date
Apprentice

_________________________  Date
Supervisor/Trainer

5278.04  Manufacture the prototype piece part using preliminary sketches, fabricated tooling aids, fixtures, press, and finishes, so that the dimensions, shape, tolerances, and surface finish of the piece part conform to job specifications and engineering drawings.

Signatures of:

_________________________  Date
Apprentice

_________________________  Date
Supervisor/Trainer

5278.05  Perform final inspection using precision measuring and checking devices instruments including (not limited to) inside and outside micrometers, vernier height gauges or indicators, gauge blocks, and pin gauges, to ensure that the tolerances and dimensions of the completed prototype conform to the engineering drawings and job specifications.

Signatures of:

_________________________  Date
Apprentice

_________________________  Date
Supervisor/Trainer
5278.00  FABRICATE A PROTOTYPE PIECE PART…cont’d

5278.06  Document the prototype piece part building-process to identify drawings, materials used, and all sequences, procedures, and processes utilized in the design and production of the prototype, ensuring that all developmental information is clearly and accurately recorded in accordance with job specifications and company standards/procedures.

Signatures of:

__________________________________________  ________________________
Apprentice  Date

__________________________________________  ________________________
Supervisor/Trainer  Date

__________________________________________  ________________________
Sponsor/Employer Name  Sponsor/Employer Signature
5279.00 ASSEMBLE AND FINALIZE DIES

GENERAL PERFORMANCE OBJECTIVE

Assemble and finalize dies by: reading and interpreting die drawings and sketches; setting up and operating try-out press; spot-forming the steels and tools; preparing and forming an initial blank; tool-proofing forming stations; finalizing the blank shape; preparing and finalizing cutting steels; finalizing die assembly for final piece part production; trying-out and trouble-shooting the die; inspecting part produced by the developed die; final inspecting die; and, completing work documentation.

PERFORMANCE OBJECTIVES

SKILLS

5279.01 Read and interpret die drawings and sketches to identify tolerances, material specifications, machine finishes, section views, revision level, diameters, sizes, tolerances, projections, and any other information required for the die development process.

Signatures of:

Apprentice Date

Supervisor/Trainer Date

5279.02 Set up and operate press for trying out the die to determine that all operations are in sequence, controls are set for the correct strokes per minute, and the pre-fabricated die is located and positioned, so that no damage is caused to press or die and personal safety is ensured in accordance with engineering drawings, Safety Legislation, and company standards/procedures.

Signatures of:

Apprentice Date

Supervisor/Trainer Date
5279.00 ASSEMBLE AND FINALIZE DIES…cont’d

5279.03 **Spot-form the steels and tools** by performing spot-forming procedures and using try-out materials and equipment, high-spot blue, and die-grinding equipment, so that the material gap is adjusted to the required thickness as specified in the engineering specifications, sketches, and company standards/procedures.

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5279.04 **Prepare and form an initial blank** by performing forming and machining procedures and calculating the bend allowances and draw, so that the initial blank is the correct size and shape for try out in the forming operation in accordance with engineering drawings, sketches, and job specifications.

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5279.05 **Tool-proof forming stations** using the previously formed blank and circle-grid analysis or graphing procedures to analyse the material flow, so that forming failures are corrected and necessary adjustments are made to the form including (not limited to) adding draw beads, changing the form radii, and changing clearances in accordance with engineering drawings, sketches, and job specifications.

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5279.00  ASSEMBLE AND FINALIZE DIES…cont’d

5279.06  **Finalize the blank shape** by: using information from job documentation; inspecting the formed part; and, performing circle-grid analysis or graphing procedures; so that the failures are corrected and modifications are made to the size and shape of the initial blank in conformance with the piece part, job specifications and engineering drawings.

Signatures of:

__________________________________________  Date
Apprentice

__________________________________________  Date
Supervisor/Trainer

5279.07  **Prepare and finalize cutting steels** using the finalized blank and information from engineering drawings, so that the size and shape of the cutting steels are finalized to produce a die-cut blank to the required cutting clearances specified in engineering drawings and job specifications.

Signatures of:

__________________________________________  Date
Apprentice

__________________________________________  Date
Supervisor/Trainer

5279.08  **Finalize die assembly for final piece part production** by following required procedures and using fasteners including (not limited to) dowels, adhesives, and assembly equipment so that the assembled die conforms to engineering drawings and job specifications.

Signatures of:

__________________________________________  Date
Apprentice

__________________________________________  Date
Supervisor/Trainer
5279.00 ASSEMBLE AND FINALIZE DIES…cont’d

5279.09 **Try out and trouble-shoot the die** by following required procedures including (not limited to): trying out in die press; checking for workpiece failures including worn, dull, or chipped edges, distortion of parts, excessive burrs, and inadequate or improper lubrication; measuring and checking; making adjustments or modifications; and, continuing to re-try until the die passes final quality inspection and conforms with engineering drawings, job specifications, and company standards/procedures.

**Signatures of:**

Apprentice __________________________ Date __________

Supervisor/Trainer __________________________ Date __________

5279.10 **Inspect part produced by developed die** using information from part drawings and by checking all specifications using measuring instruments and checking devices to ensure that the piece part produced by the die conforms to engineering drawings, job specifications, and company standards/procedures.

**Signatures of:**

Apprentice __________________________ Date __________

Supervisor/Trainer __________________________ Date __________

5279.11 **Final inspect die** by analysing, checking, and making adjustments, so that the finalized die functions without premature die failures and conforms to engineering drawings, company standards/procedures, and job specifications.

**Signatures of:**

Apprentice __________________________ Date __________

Supervisor/Trainer __________________________ Date __________
5279.00  ASSEMBLE AND FINALIZE DIES…cont’d

5279.12  Complete work documentation including (not limited to) tracking sheets, sign-off sheets, inspection reports, or procedure sheets to record the finalization of jobs and to facilitate traceability of work-in-process, ensuring that all data is recorded accurately and clearly in accordance with engineering drawings, job specifications, and company standards/procedures.

Signatures of:

________________________________________________________________________
Apprentice                                        Date

________________________________________________________________________
Supervisor/Trainer                                Date

________________________________________________________________________
Sponsor/Employer Name                            Sponsor/Employer Signature
## APPRENTICE RECORD

### APPRENTICE NAME (Print):

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<tr>
<th>SPONSOR/EMPLOYER INFORMATION</th>
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### SUMMARY OF TRAINING

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<td>Total hours of training &amp; instruction between dates of employment.</td>
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Date Completed  Apprentice  Supervisor/Trainer
## Tool and Die Maker Apprentice Record

### Apprentice Name (Print):

### Sponsor/Employer Information

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Total hours of training & instruction between dates of employment.

Date Completed       Apprentice       Supervisor/Trainer
## TOOL AND DIE MAKER

### APPRENTICE RECORD

**APPRENTICE NAME (Print):**

### SPONSOR/EMPLOYER INFORMATION

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Date Completed  
Apprentice  
Supervisor/Trainer
### APPRENTICE COMPLETION FORM

#### APPRENTICE INFORMATION

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<td>Signature</td>
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Skill Sets when completed should be signed by the Supervisor/Trainer and presented with this completion form to your local Apprenticeship Client Services Office. Any supporting documentation should also be attached.

- **In-school Completed**: Yes (  )  No (  )  Not applicable (  )
- **Hours completed as Per Contract**: Yes (  )  No (  )  Not applicable (  )

#### SPONSOR/EMPLOYER INFORMATION

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You will be required to disclose this signed form to the Ministry of Training, Colleges and Universities in order to complete your program. The Ministry will use your personal information to administer and finance Ontario’s apprenticeship training system. For further information please see the notice/declaration for collection of personal information that is referenced in the table of contents of this training standard.