

Instruction Sheet for the Candidate

Qualification	National Vocational Certificate in Metal Forming & Processing Level 5
Competency Standards	<ul style="list-style-type: none"> • CS 56 Perform Computerized Numerical Control, CNC Operations • CS 57 Perform CNC EDM Wire-Cut Operations • CS 58 Perform GTAW / TIG Welding • CS 59 Perform GMAW (MIG/MAG) and FCAW Welding • CS 60 Carryout Continuous Casting Machine (CCM) operations • CS 61 Carryout Metal processing with Metallic powder • CS 62 Perform Pre- Rolling Operation • CS 63 Perform Hot & Cold Rolling Process • CS 64 Perform Metallography of Metallic Materials • CS 65 Perform Handheld XRF Analysis • CS 66 Perform optical emission spectroscopic analysis • CS 67 Perform Non-Destructive Testing • CS 68 Perform Galvanizing Coating • CS 69 Perform Conversion Coating (Anodizing) • CS 70 Develop Project Proposal • CS 71 Develop project management plan • CS 72 Develop sales plan • CS 73 Conduct research for customer needs and satisfaction
Purpose of Assessment	Summative Assessment
Candidate Details	Name _____ Registration/Roll Number _____
Guidance for Candidate	<p>To meet this standard, you are required to complete the following within 04 Hrs. time frame (for practical demonstration & assessment):</p> <p>Manufacture press tools or gauges using CNC machine operations and perform Dye Penetrant Test to conduct inspection subsequently perform required protective coating.</p>
Time: 04 Hrs.	<p>During a practical assessment, under observation by an assessor, you are required to</p> <p>Manufacture press tools or gauges using CNC machine operations and perform Dye Penetrant Test to conduct inspection subsequently perform required protective coating</p>

<p>Minimum Evidence Required</p>	<ul style="list-style-type: none"> P1. Interpret tool design from given drawings or prints and check against customer requirements. P2. Select materials to meet tooling requirements for strength, durability, component finish and heat treatment qualities. P3. Test selected material for hardness to aid selection of machine tools and hand held power tools to shape tooling components. P4. Perform material leveling, straightening, rolling, pressing or bending operation to specifications/drawings using fabrication techniques P5. Tack and/or weld material using standard welding process as per requirement P6. Select required machining process from a range of standard tool room machines to shape/produce tooling components to specifications. P7. Produce basic NC/CNC machine program in standard code format in accordance with standard operating procedures P8. Operate the NC/CNC machine in manual mode to test and prove program. P9. Run the program to perform required machining operations and shape the component P10. Check the components using acceptable tool making techniques and assemble as per specifications. P11. Verify conformance to specification and report according to standard operating procedures. P12. Prepare inspection areas for dye penetrant testing P13. Carry out dye penetrant test in accordance with relevant standards, specifications and OH&S requirements. P14. Report the results of dye penetrant test. P15. Identify protective coating requirements as per requirement P16. Check all plant and equipment relevant to process for compliance with safety and operational requirements P17. Arrange Instrumentation/gauges for operation. P18. Carry out coating steps in correct sequence according to standard operating procedures or work instructions. P19. Visually inspect finished products for compliance to specification.
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Self-Assessment Checklist

Candidate Name	
Registration No.	
Qualification	National Vocational Certificate in Metal Forming & Processing Level 5
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Purpose of Assessment	Summative Assessment
Assessment Task	Manufacture press tools or gauges using CNC machine operations and perform Dye Penetrant Test to conduct inspection subsequently perform required protective coating

I can.....

Performance Criteria	Yes	No
P1. Interpret tool design from given drawings or prints and check against customer requirements.	<input type="checkbox"/>	<input type="checkbox"/>
P2. Select materials to meet tooling requirements for strength, durability, component finish and heat treatment qualities.	<input type="checkbox"/>	<input type="checkbox"/>
P3. Test selected material for hardness to aid selection of machine tools and hand held power tools to shape tooling components.	<input type="checkbox"/>	<input type="checkbox"/>
P4. Perform material leveling, straightening, rolling, pressing or bending operation to specifications/drawings using fabrication techniques	<input type="checkbox"/>	<input type="checkbox"/>
P5. Tack and/or weld material using standard welding process as per requirement	<input type="checkbox"/>	<input type="checkbox"/>

P6. Select required machining process from a range of standard tool room machines to shape/produce tooling components to specifications.	<input type="checkbox"/>	<input type="checkbox"/>
P7. Produce basic NC/CNC machine program in standard code format in accordance with standard operating procedures	<input type="checkbox"/>	<input type="checkbox"/>
P8. Operate the NC/CNC machine in manual mode to test and prove program.	<input type="checkbox"/>	<input type="checkbox"/>
P9. Run the program to perform required machining operations and shape the component	<input type="checkbox"/>	<input type="checkbox"/>
P10. Check the components using acceptable tool making techniques and assemble as per specifications.	<input type="checkbox"/>	<input type="checkbox"/>
P11. Verify conformance to specification and report according to standard operating procedures.	<input type="checkbox"/>	<input type="checkbox"/>
P12. Prepare inspection areas for dye penetrant testing	<input type="checkbox"/>	<input type="checkbox"/>
P13. Carry out dye penetrant test in accordance with relevant standards, specifications and OH&S requirements.	<input type="checkbox"/>	<input type="checkbox"/>
P14. Report the results of dye penetrant test.	<input type="checkbox"/>	<input type="checkbox"/>
P15. Identify protective coating requirements as per requirement	<input type="checkbox"/>	<input type="checkbox"/>
P16. Check all plant and equipment relevant to process for compliance with safety and operational requirements	<input type="checkbox"/>	<input type="checkbox"/>
P17. Arrange Instrumentation/gauges for operation.	<input type="checkbox"/>	<input type="checkbox"/>
P18. Carry out coating steps in correct sequence according to standard operating procedures or work instructions.	<input type="checkbox"/>	<input type="checkbox"/>
P19. Visually inspect finished products for compliance to specification.	<input type="checkbox"/>	<input type="checkbox"/>

Candidate's Signature_____ Assessor's Signature_____

Date: _____

Assessors Judgment Guide

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Purpose of Assessment	Summative Assessment
Candidate Details	Name: _____ Registration/Roll Number: _____ Signature: _____
Assessment Outcome	COMPETENT <input type="checkbox"/> NOT YET COMPETENT <input type="checkbox"/> Name of the Assessor _____ Assessor's code: _____ Signature: _____

Assessment Summary (to be filled by the assessor)		
Activity	Method	Result

Nature of Activity	Written	Oral	Observation	Portfolio	Role Play	Competent	Not Yet Competent
Practical Skill Demonstration			✓				
Knowledge Assessment		✓					
Other Requirement							

Observation Checklist

Assessment Task		Manufacture press tools or gauges using CNC machine operations and perform Dye Penetrant Test to conduct inspection subsequently perform required protective coating			
During the practical assessment, candidate demonstrated the following:		Yes	No	Remarks	
1.	Interpret tool design from given drawings or prints and check against customer requirements.				
2.	Select materials to meet tooling requirements for strength, durability, component finish and heat treatment qualities.				
3.	Test selected material for hardness to aid selection of machine tools and hand held power tools to shape tooling components.				
4.	Perform material leveling, straightening, rolling, pressing or bending operation to specifications/drawings using fabrication techniques				
5.	Tack and/or weld material using standard welding process as per requirement				
6.	Select required machining process from a range of standard tool room machines to shape/produce tooling components to specifications.				
7.	Produce basic NC/CNC machine program in standard code format in accordance with standard operating procedures				
8.	Operate the NC/CNC machine in manual mode to test and prove program.				
9.	Run the program to perform required machining operations and shape the component				

10.	Check the components using acceptable tool making techniques and assemble as per specifications.			
11.	Verify conformance to specification and report according to standard operating procedures.			
12.	Prepare inspection areas for dye penetrant testing			
13.	Carry out dye penetrant test in accordance with relevant standards, specifications and OH&S requirements.			
14.	Report the results of dye penetrant test.			
15.	Identify protective coating requirements as per requirement			
16.	Check all plant and equipment relevant to process for compliance with safety and operational requirements			
17.	Arrange Instrumentation/gauges for operation.			
18.	Carry out coating steps in correct sequence according to standard operating procedures or work instructions.			
19.	Visually inspect finished products for compliance to specification.			
Competent <input type="checkbox"/>		Not Yet Competent <input type="checkbox"/>		

Knowledge Assessment

Qualification	National Vocational Certificate in Metal Forming & Processing Level 5
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Purpose of Assessment	Summative Assessment
Candidate Details	Name: _____ Registration/Roll Number: _____ Candidate Signature: _____
Assessment Outcome	<div style="display: flex; justify-content: space-between; align-items: center;"> COMPETENT <input type="checkbox"/> NOT YET COMPETENT <input type="checkbox"/> </div> Name of the Assessor: _____ Assessor's code: _____ Signature of the Assessor: _____

Candidate's response is not required to be identical, but similar concepts and/or keywords must be used. Oral questioning may be used to clarify candidate understanding of topic and its application.

Questions (Candidate confidently answered questions correctly and demonstrated understanding of the topics and their application)		Satisfactory	Not Satisfactory
1.	What are the physical properties of a material required for tool steels		
2.	Explain the reasons for selecting materials in terms of strength & durability for each component of the tooling		
3.	What is the procedure followed for hardness testing of materials		
4.	Describe hot and cold forming/shaping processes		
5.	Explain the allowances when forming/shaping materials		
6.	What are the elements of an NC/CNC program		

7.	Explain the selection of tool path(s) and sequence of operations		
8.	Describe the types of discontinuities and their consequences/effect on the material		
9.	What are the hazards and safety requirements associated with penetrant testing		
10.	Describe the maintenance and storage procedures for test equipment		
11.	What are the common faults and damages diagnose with DPT		

	12. What is the purpose of galvanized coating?		

Feedback to the Candidate	
Candidate's Signature _____	Assessor's Signature _____