

## Instruction Sheet for the Candidate

<b>Qualification</b>	<b>National Vocational Certificate in Metal Forming &amp; Processing Level 3</b>
<b>Competency Standard</b>	<b>Perform Extrusion Process</b>
<b>Purpose of Assessment</b>	<b>Formative Assessment</b>
<b>Candidate Details</b>	Name _____ Registration/Roll Number _____
<b>Guidance for Candidate</b>	<p><b>To meet this standard, you are required to complete the following within 04 Hrs. time frame (for practical demonstration &amp; assessment):</b></p> <ul style="list-style-type: none"> <li>• Prepare the raw material</li> <li>• Install the required die for direct/indirect extrusion.</li> <li>• Prepare for hot extrusion Process</li> <li>• Perform direct/indirect extrusion process.</li> <li>• Inspect the product</li> </ul>
<b>Time: 04 Hrs.</b>	During a practical assessment, under observation by an assessor, you are required to
<b>Minimum Evidence Required</b>	<p><b>Prepare the raw material</b></p> <ol style="list-style-type: none"> <li>1. Select the raw materials for extrusion as per requirement.</li> <li>2. Identify lubricants and additives required in extrusion operations.</li> <li>3. Identify the suitability of a material for extrusion depends on: the temperature range over which extrusion is possible</li> </ol> <p><b>Install the required die for direct/indirect extrusion.</b></p> <ol style="list-style-type: none"> <li>1. Place the suitable die on machine with lifting equipment.</li> <li>2. Clamp the die as per requirement</li> <li>3. Align the die on machine.</li> <li>4. Operate machine manually and match the upper and lower dies</li> <li>5. Perform the trial of die to verify the operation.</li> <li>6. Identify risk associated with job.</li> <li>7. Use required PPEs</li> </ol> <p><b>Prepare for hot extrusion Process</b></p> <ol style="list-style-type: none"> <li>1. Identify the different temperature requirement</li> <li>2. Control the temperature of Die, Container and Billet as per standard operating procedure</li> </ol>

	<ol style="list-style-type: none"> <li>3. Preheating the die prior to extrusion</li> <li>4. Set required temperature for die</li> </ol> <p><b>Perform direct/indirect extrusion process.</b></p> <ol style="list-style-type: none"> <li>1. Select device required for given metal extrusion process.</li> <li>2. Follow instructions to carry out extrusion processing</li> <li>3. Check the dies are installed as per job requirement.</li> <li>4. Set the pressure as per requirement.</li> <li>5. Carry out simple preventive maintenance for metal extrusion equipment.</li> <li>6. Report the problems if any during metal extrusion processing</li> <li>7. Remove burs if applicable</li> </ol> <p><b>Inspect the product</b></p> <ol style="list-style-type: none"> <li>1. Check all dimensions of the product</li> <li>2. Perform measurements and calculations of the product.</li> <li>3. Report the error, if any, in the final product.</li> <li>4. Recommend corrective action(s) as per required specifications</li> </ol>
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## Self-Assessment Checklist

<b>Candidate Name</b>	
<b>Registration No.</b>	
<b>Qualification</b>	<b>National Vocational Certificate in Metal Forming &amp; Processing Level 3</b>
<b>Competency Standard</b>	<b>Perform Extrusion Process</b>
<b>Purpose of Assessment</b>	<b>Formative Assessment</b>
<b>Assessment Task</b>	<ul style="list-style-type: none"> <li>• Prepare the raw material</li> <li>• Install the required die for direct/indirect extrusion.</li> <li>• Prepare for hot extrusion Process</li> <li>• Perform direct/indirect extrusion process.</li> <li>• Inspect the product</li> </ul>

I can.....

<b>Performance Criteria</b>	<b>Yes</b>	<b>No</b>
1. Select the raw materials for extrusion as per requirement.	<input type="checkbox"/>	<input type="checkbox"/>
2. Identify lubricants and additives required in extrusion operations.	<input type="checkbox"/>	<input type="checkbox"/>
3. Identify the suitability of a material for extrusion depends on: the temperature range over which extrusion is possible	<input type="checkbox"/>	<input type="checkbox"/>
4. Place the suitable die on machine with lifting equipment.	<input type="checkbox"/>	<input type="checkbox"/>
5. Clamp the die as per requirement	<input type="checkbox"/>	<input type="checkbox"/>
6. Align the die on machine.	<input type="checkbox"/>	<input type="checkbox"/>
7. Operate machine manually and match the upper and lower dies	<input type="checkbox"/>	<input type="checkbox"/>
8. Perform the trial of die to verify the operation.	<input type="checkbox"/>	<input type="checkbox"/>
9. Identify risk associated with job.	<input type="checkbox"/>	<input type="checkbox"/>
10. Use required PPEs	<input type="checkbox"/>	<input type="checkbox"/>
11. Identify the different temperature requirement	<input type="checkbox"/>	<input type="checkbox"/>
12. Control the temperature of Die, Container and Billet as per standard operating procedure	<input type="checkbox"/>	<input type="checkbox"/>
13. Preheating the die prior to extrusion	<input type="checkbox"/>	<input type="checkbox"/>
14. Set required temperature for die	<input type="checkbox"/>	<input type="checkbox"/>
15. Select device required for given metal extrusion process.	<input type="checkbox"/>	<input type="checkbox"/>
16. Follow instructions to carry out extrusion processing	<input type="checkbox"/>	<input type="checkbox"/>
17. Check the dies are installed as per job requirement.	<input type="checkbox"/>	<input type="checkbox"/>

18. Set the pressure as per requirement.	<input type="checkbox"/>	<input type="checkbox"/>
19. Carry out simple preventive maintenance for metal extrusion equipment.	<input type="checkbox"/>	<input type="checkbox"/>
20. Report the problems if any during metal extrusion processing	<input type="checkbox"/>	<input type="checkbox"/>
21. Remove burs if applicable	<input type="checkbox"/>	<input type="checkbox"/>
22. Check all dimensions of the product	<input type="checkbox"/>	<input type="checkbox"/>
23. Perform measurements and calculations of the product.	<input type="checkbox"/>	<input type="checkbox"/>
24. Report the error, if any, in the final product.	<input type="checkbox"/>	<input type="checkbox"/>
25. Recommend corrective action(s) as per required specifications	<input type="checkbox"/>	<input type="checkbox"/>

Candidate's Signature \_\_\_\_\_ Assessor's Signature \_\_\_\_\_

Date: \_\_\_\_\_

## Assessors Judgment Guide

<b>Qualification</b>	<b>National Vocational Certificate in Metal Forming &amp; Processing Level 3</b>
<b>Competency Standard</b>	<b>Perform Extrusion Process</b>
<b>Purpose of Assessment</b>	<b>Formative Assessment</b>
<b>Candidate Details</b>	Name: _____ Registration/Roll Number: _____ Signature: _____
<b>Assessment Outcome</b>	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

<b>Assessment Task</b>	<ul style="list-style-type: none"> <li>• Prepare the raw material</li> <li>• Install the required die for direct/indirect extrusion.</li> <li>• Prepare for hot extrusion Process</li> <li>• Perform direct/indirect extrusion process.</li> <li>• Inspect the product</li> </ul>			
<b>During the practical assessment, candidate demonstrated the following:</b>		<b>Yes</b>	<b>No</b>	<b>Remarks</b>
1.	Select the raw materials for extrusion as per requirement.			

2.	Identify lubricants and additives required in extrusion operations.			
3.	Identify the suitability of a material for extrusion depends on: the temperature range over which extrusion is possible			
4.	Place the suitable die on machine with lifting equipment.			
5.	Clamp the die as per requirement			
6.	Align the die on machine.			
7.	Operate machine manually and match the upper and lower dies			
8.	Perform the trial of die to verify the operation.			
9.	Identify risk associated with job.			
10.	Use required PPEs			
11.	Identify the different temperature requirement			
12.	Control the temperature of Die, Container and Billet as per standard operating procedure			
13.	Preheating the die prior to extrusion			
14.	Set required temperature for die			
15.	Select device required for given metal extrusion process.			
16.	Follow instructions to carry out extrusion processing			
17.	Check the dies are installed as per job requirement.			
18.	Set the pressure as per requirement.			
19.	Carry out simple preventive maintenance for metal extrusion equipment.			
20.	Report the problems if any during metal extrusion processing			
21.	Remove burs if applicable			
22.	Check all dimensions of the product			
23.	Perform measurements and calculations of the product.			
24.	Report the error, if any, in the final product.			

25.	Recommend corrective action(s) as per required specifications			
Competent <input type="checkbox"/>		Not Yet Competent <input type="checkbox"/>		

## Knowledge Assessment

<b>Qualification</b>	<b>National Vocational Certificate in Metal Forming &amp; Processing Level 3</b>
<b>Competency Standard</b>	<b>Perform Extrusion Process</b>
<b>Purpose of Assessment</b>	<b>Formative Assessment</b>
<b>Candidate Details</b>	Name: _____ Registration/Roll Number: _____ Candidate Signature: _____
<b>Assessment Outcome</b>	<div style="display: flex; justify-content: space-around; align-items: center;"> <span><b>COMPETENT</b> <input type="checkbox"/></span> <span><b>NOT YET COMPETENT</b> <input type="checkbox"/></span> </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.	Enlist types of extrusion process		
2.	Define hot and cold extrusion		
3.	Enlist extrusion defects		



4.	Enlist types of dies used in extrusion		
5.	What is the purpose of lubrication in extrusion process		
6.	Enlist types of coolant used in extrusion process		

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