

## Instruction Sheet for the Candidate

<b>Qualification</b>	<b>National Vocational Certificate in Metal Forming &amp; Processing Level 5</b>
<b>Competency Standard</b>	Perform Conversion Coating (Anodizing)
<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>• CU1. Perform cataloging</li> <li>• CU2. Perform Cleaning Operation</li> <li>• CU3. Perform Solution Preparation</li> <li>• CU3. Set up Coating bath</li> <li>• CU4. Perform Coating Operation</li> <li>• CU5. Perform Drying Operation</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>CU1. Perform cataloging</b></p> <p>P1. Perform documentation of the initial conditions of Specimen and recognize its identity.</p> <p>P2. Follow standard safety practice and procedure for handling.</p> <p>P3. Prepare job layout according to process requirements</p> <p><b>CU2. Perform Cleaning Operation</b></p> <p>P1. Identify the cleaning process as per requirement of standards.</p> <p>P2. Follow standard safety practice and procedure for chemical handling.</p> <p>P3. Select the specimen side or face, which will be coating.</p> <p>P4. Prepare degreasing cleaning solution where steel is treated with spirit solution which removes common dirt and oils.</p> <p>P5. Place specimen in the solution for specific time then remove and rinsing with water.</p> <p>P6. Prepare chemical cleaning solution where the surface rust and scales are removed by using alkaline solution.</p> <p>P7. Place specimen in the solution for specific time then remove and rinsing with water.</p> <p>P8. Prepare nitric acid solution where the surface oxides are removed.</p> <p>P9. Place specimen in the solution for specific time.</p>

	<p><b>P10.</b>Remove the specimen from bath and ready for next step.</p> <p><b>CU3. Perform Solution Preparation</b></p> <p><b>P1.</b>Take glass beaker or polythene tank.</p> <p><b>P2.</b>Follow standard safety practice and procedure for handling chemical process.</p> <p><b>P3.</b>Filled half with distill or deionized water.</p> <p><b>P4.</b>Add acid solution slowly and stir it.</p> <p><b>CU4. Set up Coating bath</b></p> <p><b>P1.</b>Add prepared solution in the bath.</p> <p><b>P2.</b>Follow standard safety practice and procedure for handling process.</p> <p><b>P3.</b>Place the lead sheets or plates on the opposite sides of bath. ( Act as cathodes )</p> <p><b>P4.</b>Connect the both lead plates to electric supply.</p> <p><b>P5.</b>Place Ti rod or wood coiled with Al wire in the middle of bath. (Act as Anode )</p> <p><b>P6.</b>Connect the bar to electric supply.</p> <p><b>P7.</b>Arrange them in sequence and order that they don't touch each other.</p> <p><b>P8.</b>Hang the specimen with wire to anode.</p> <p><b>CU5. Perform Coating Operation</b></p> <p><b>P1.</b>Identify anodizing specifications.</p> <p><b>P2.</b>Follow standard safety practice and procedure for handling process.</p> <p><b>P3.</b>Switch on rectifier and adjust required current density.</p> <p><b>P4.</b>Allow coating deposition for specific time.</p> <p><b>P5.</b>Agitate the bath with air bubbles system.</p> <p><b>P6.</b>Bath temperature should be maintain from 20-25C.</p> <p><b>P7.</b>Switch off rectifier and remove specimen.</p> <p><b>CU6. Perform Drying Operation</b></p> <p><b>P1.</b>Place specimen in the drying oven.</p> <p><b>P2.</b>Set temperature the switch on oven.</p> <p><b>P3.</b>Remove specimen after specific time for drying.</p>
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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 5</b>
<b>Competency Standard</b>	Perform Conversion Coating (Anodizing)
<b>Purpose of Assessment</b>	<b>Formative Assessment</b>
<b>Assessment Task</b>	<ul style="list-style-type: none"> <li>• CU1. Perform cataloging</li> <li>• CU2. Perform Cleaning Operation</li> <li>• CU3. Perform Solution Preparation</li> <li>• CU3. Set up Coating bath</li> <li>• CU4. Perform Coating Operation</li> <li>• CU5. Perform Drying Operation</li> </ul>

I can.....

<b>Performance Criteria</b>	<b>Yes</b>	<b>No</b>
<b>P1.</b> Perform documentation of the initial conditions of Specimen and recognize its identity.	<input type="checkbox"/>	<input type="checkbox"/>
<b>P2.</b> Follow standard safety practice and procedure for handling.	<input type="checkbox"/>	<input type="checkbox"/>
<b>P3.</b> Prepare job layout according to process requirements	<input type="checkbox"/>	<input type="checkbox"/>
<b>P4.</b> Identify the cleaning process as per requirement of standards.	<input type="checkbox"/>	<input type="checkbox"/>
<b>P5.</b> Adopt standard safety practice and procedure for chemical handling.	<input type="checkbox"/>	<input type="checkbox"/>
<b>P6.</b> Select the specimen side or face, which will be coating.	<input type="checkbox"/>	<input type="checkbox"/>
<b>P7.</b> Prepare degreasing cleaning solution where steel is treated with spirit solution which removes common dirt and oils.	<input type="checkbox"/>	<input type="checkbox"/>
<b>P8.</b> Place specimen in the solution for specific time then remove and rinsing with water.	<input type="checkbox"/>	<input type="checkbox"/>
<b>P9.</b> Prepare chemical cleaning solution where the surface rust and scales are removed by using alkaline solution.	<input type="checkbox"/>	<input type="checkbox"/>
<b>P10.</b> Place specimen in the solution for specific time then remove and rinsing with water.	<input type="checkbox"/>	<input type="checkbox"/>
<b>P11.</b> Prepare nitric acid solution where the surface oxides are removed.	<input type="checkbox"/>	<input type="checkbox"/>
<b>P12.</b> Place specimen in the solution for specific time.	<input type="checkbox"/>	<input type="checkbox"/>
<b>P13.</b> Remove the specimen from bath and ready for next step.	<input type="checkbox"/>	<input type="checkbox"/>
<b>P14.</b> Take glass beaker or polythene tank.	<input type="checkbox"/>	<input type="checkbox"/>
<b>P15.</b> Follow standard safety practice and procedure for	<input type="checkbox"/>	<input type="checkbox"/>

handling chemical process.		
<b>P16.</b> Filled half with distill or deionized water.	<input type="checkbox"/>	<input type="checkbox"/>
<b>P17.</b> Add acid solution slowly and stir it		
<b>P18.</b> Add prepared solution in the bath.	<input type="checkbox"/>	<input type="checkbox"/>
<b>P19.</b> Follow standard safety practice and procedure for handling process.	<input type="checkbox"/>	<input type="checkbox"/>
<b>P20.</b> Place the lead sheets or plates on the opposite sides of bath. ( Act as cathodes )	<input type="checkbox"/>	<input type="checkbox"/>
<b>P21.</b> Connect the both lead plates to electric supply.	<input type="checkbox"/>	<input type="checkbox"/>
<b>P22.</b> Place Ti rod or wood coiled with Al wire in the middle of bath. (Act as Anode )	<input type="checkbox"/>	<input type="checkbox"/>
<b>P23.</b> Connect the bar to electric supply.	<input type="checkbox"/>	<input type="checkbox"/>
<b>P24.</b> Arrange them in sequence and order that they don't touch each other.	<input type="checkbox"/>	<input type="checkbox"/>
<b>P25.</b> Hang the specimen with wire to anode.	<input type="checkbox"/>	<input type="checkbox"/>
<b>P26.</b> Identify anodizing specifications.	<input type="checkbox"/>	<input type="checkbox"/>
<b>P27.</b> Follow standard safety practice and procedure for handling process.	<input type="checkbox"/>	<input type="checkbox"/>
<b>P28.</b> Switch on rectifier and adjust required current density.	<input type="checkbox"/>	<input type="checkbox"/>
<b>P29.</b> Allow coating deposition for specific time.	<input type="checkbox"/>	<input type="checkbox"/>
<b>P30.</b> Agitate the bath with air bubbles system.	<input type="checkbox"/>	<input type="checkbox"/>
<b>P31.</b> Bath temperature should be maintain from 20-25C.	<input type="checkbox"/>	<input type="checkbox"/>
<b>P32.</b> Switch off rectifier and remove specimen.	<input type="checkbox"/>	<input type="checkbox"/>
<b>P33.</b> Place specimen in the drying oven.	<input type="checkbox"/>	<input type="checkbox"/>
<b>P34.</b> Set temperature the switch on oven.	<input type="checkbox"/>	<input type="checkbox"/>
<b>P35.</b> Remove specimen after specific time for drying.	<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 5</b>
<b>Competency Standard</b>	Perform Conversion Coating (Anodizing)
<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>• CU1. Perform cataloging</li> <li>• CU2. Perform Cleaning Operation</li> <li>• CU3. Perform Solution Preparation</li> <li>• CU3. Set up Coating bath</li> <li>• CU4. Perform Coating Operation</li> <li>• CU5. Perform Drying Operation</li> </ul>		
<b>During the practical assessment, candidate demonstrated the following:</b>		<b>Yes</b>	<b>No</b>	<b>Remarks</b>
1.	Perform documentation of the initial conditions of Specimen and recognize its identity.			
2.	Adopt standard safety practice and procedure for handling.			
3.	Prepare job layout according to process requirements			
4.	Identify the cleaning process as per requirement of standards.			
5.	Follow standard safety practice and procedure for chemical handling.			
6.	Select the specimen side or face, which will be coating.			
7.	Prepare degreasing cleaning solution where steel is treated with spirit solution which removes common dirt and oils.			
8.	Place specimen in the solution for specific time then remove and rinsing with water.			
9.	Prepare chemical cleaning solution where the surface rust and scales are removed by using alkaline solution.			
10.	Place specimen in the solution for specific time then remove and rinsing with water.			
11.	Prepare nitric acid solution where the surface oxides are removed.			
12.	Place specimen in the solution for specific time.			
13.	Remove the specimen from bath and ready for next step.			
14.	Take glass beaker or polythene tank.			
15.	Follow standard safety practice and procedure for handling chemical process.			
16.	Filled half with distill or deionized water.			
17.	Add acid solution slowly and stir it			

18.	Add prepared solution in the bath.			
19.	Follow standard safety practice and procedure for handling process.			
20.	Place the lead sheets or plates on the opposite sides of bath. ( Act as cathodes )			
21.	Connect the both lead plates to electric supply.			
22.	Place Ti rod or wood coiled with Al wire in the middle of bath. (Act as Anode )			
23.	Connect the bar to electric supply.			
24.	Arrange them in sequence and order that they don't touch each other.			
25.	Hang the specimen with wire to anode.			
26.	Identify anodizing specifications.			
27.	Adopt standard safety practice and procedure for handling process.			
28.	Switch on rectifier and adjust required current density.			
29.	Allow coating deposition for specific time.			
30.	Agitate the bath with air bubbles system.			
31.	Bath temperature should be maintain from 20-25C.			
32.	Switch off rectifier and remove specimen.			
33.	Place specimen in the drying oven.			
34.	Set temperature the switch on oven.			
35.	Remove specimen after specific time for drying.			
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 5</b>
<b>Competency Standard</b>	Perform Conversion Coating (Anodizing)
<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.	What does conversion coating do?		
2.	What is the difference between plating and anodizing?		
3.	Which is better powder coating or anodizing?		



4.	What is the difference between anodizing and hard anodizing?		

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