

# Model Curriculum

## Electroplating Operator

**SECTOR:** CAPITAL GOODS  
**SUB-SECTOR:** 1. Machine Tools  
2. Plastics Manufacturing Machinery  
3. Textile Manufacturing Machinery  
4. Process Plant Machinery  
5. Electrical and Power Machinery  
6. Light Engineering Goods  
**OCCUPATION:** Coating and Painting  
**REF ID:** CSC/Q0701, V1.0  
**NSQF LEVEL:** 2



## Certificate

### CURRICULUM COMPLIANCE TO QUALIFICATION PACK – NATIONAL OCCUPATIONAL STANDARDS

is hereby issued by the

**CAPITAL GOODS SKILL COUNCIL**

for the

**MODEL CURRICULUM**

Complying to National Occupational Standards of

Job Role/ Qualification Pack: **'Electroplating Operator'** QP No. **'CSC/Q 0703, NSQF Level 2'**

Date of Issuance: April 30<sup>th</sup>, 2014

Valid up to : August 30<sup>th</sup>, 2016

Head up to the right is the side of the Qualification Pack. In the  
Head up to the left is the side of the Qualification Pack.



Authorised Signatory  
Tourism & Hospitality Skill Council

## TABLE OF CONTENTS

<b>1. Curriculum</b>	<b>01</b>
<b>2. Trainer Prerequisites</b>	<b>06</b>
<b>3. Annexure: Assessment Criteria</b>	<b>07</b>

# Electroplating Operator

## CURRICULUM / SYLLABUS

This program is aimed at training candidates for the job of a “Electroplating Operator”, in the “Capital Goods” Sector/Industry and aims at building the following key competencies amongst the learner

<b>Program Name</b>	<b>Electroplating Operator</b>		
<b>Qualification Pack Name &amp; Reference ID. ID</b>	CSC/Q0701, v1.0		
<b>Version No.</b>	1.0	<b>Version Update Date</b>	
<b>Pre-requisites to Training</b>	10 <sup>th</sup> Standard Pass		
<b>Training Outcomes</b>	<b>After completing this programme, participants will be able to:</b> <ul style="list-style-type: none"><li>• <b>Perform electroplating operations on ferrous and non-ferrous metals and alloys:</b> perform a range of electroplating operations on ferrous and non-ferrous metals and alloys.</li><li>• <b>Basic health and safety practices at the workplace:</b> identify risks and hazards at workplace, use of PPE, and apply good housekeeping practices, etc.,</li><li>• <b>Work effectively with others:</b> effectively communicate with others and demonstrate good ethical practices and discipline.</li></ul>		

This course encompasses 3 out of 3 National Occupational Standards (NOS) of “Electroplating Operator” Qualification Pack issued by “Capital Goods Skill Council”.

Sr. No.	Module	Key Learning Outcomes	Equipment Required
1	<p><b>Perform electroplating operations on ferrous and non –ferrous metals and alloys</b></p> <p><b>Theory Duration</b> (hh:mm) 40:00</p> <p><b>Practical Duration</b> (hh:mm) 100:00</p> <p><b>Corresponding NOS Code</b> <b>CSC/N0701</b></p>	<ul style="list-style-type: none"> <li>• State the need for electroplating</li> <li>• Explain the process of electroplating</li> <li>• Describe the parameters determining the final quality of the component <ul style="list-style-type: none"> <li>○ Time</li> <li>○ Temperature</li> <li>○ Current</li> <li>○ Density</li> <li>○ Voltage</li> </ul> </li> <li>• Use metric system of measurement</li> <li>• Explain the use of various treatment baths</li> <li>• List the materials suitable for electroplating</li> <li>• List various chemicals and salts used in the electroplating and their suitability</li> <li>• Explain various pre-treatment activities <ul style="list-style-type: none"> <li>○ Surface cleaning</li> <li>○ Anodic cleaning</li> <li>○ Hot alkaline degreasing</li> <li>○ Drying</li> <li>○ Polishing</li> <li>○ Packing or coating</li> <li>○ Pre-heating etc</li> </ul> </li> <li>• Explain critical settings and instruments used for this purpose</li> <li>• Hazards associated with electroplating operations and methods to minimise such hazards</li> <li>• Identify Personal Protective Equipment (PPE)</li> <li>• Extract information from the job specifications and electroplating requirements <ul style="list-style-type: none"> <li>○ Coating thickness</li> <li>○ Appearance</li> <li>○ Ductility</li> <li>○ Hardness</li> <li>○ Corrosion resistance</li> <li>○ Wear etc.</li> </ul> </li> <li>• Prepare the equipment for the electroplating</li> <li>• Check that the measuring instruments are calibrated and in good working condition</li> <li>• Prepare the solution for heat treatment</li> <li>• Carryout pre-treatment activities</li> <li>• Position and fix the component using appropriate holding device</li> <li>• Load components safely into the treatment plant/solutions</li> </ul>	<p>Training kit (Trainer guide, PowerPoint), leather aprons, eye protection, overalls, face masks, breathing equipment, various metal samples- steel, copper, brass, cast iron, stainless steel etc., power source, volt meter, AMP meter, temperature recorders/indicators, salt bath, specialised jigs, fixtures etc.</p>

Sr. No.	Module	Key Learning Outcomes	Equipment Required
		<ul style="list-style-type: none"> <li>• Set parameters as per the instruction sheet               <ul style="list-style-type: none"> <li>○ Voltage</li> <li>○ Current</li> <li>○ Temperature</li> </ul> </li> <li>• Takeout the component from the solution</li> <li>• Perform required post treatment activities               <ul style="list-style-type: none"> <li>○ Curing</li> <li>○ Cooling</li> <li>○ Quenching</li> </ul> </li> <li>• Check for the quality of plating and ensure that the electroplating meets the required quality parameters</li> <li>• Carryout physical inspection and observe for any defects and take corrective actions               <ul style="list-style-type: none"> <li>○ Free from roughness</li> <li>○ Pitting</li> <li>○ Cracking</li> <li>○ Bubbles or machining marks</li> <li>○ Any physical damage</li> <li>○ Any contamination</li> <li>○ Thickness of deposit/ coating</li> <li>○ Colour and brightness</li> <li>○ Porosity of coating</li> <li>○ Deposit hardness</li> <li>○ Brittleness of deposit</li> <li>○ Abrasion resistance</li> </ul> </li> <li>• Report unresolved problems to the concerned authority</li> <li>• Dispose of wastes as per the company policy</li> <li>• Follow the recommended procedure to shutdown the equipment correctly</li> <li>• Fill up appropriate technical forms, process logs, activity charts etc.</li> <li>• Convey and share technical information clearly</li> <li>• Interact politely with supervisors and co workers</li> <li>• Demonstrate problem solving abilities</li> <li>• Plan, prioritize and sequence work operations as per job requirement</li> <li>• Manage self and other team members</li> <li>• Work in a team to achieve better results</li> </ul>	
2	<p><b>Health and safety</b></p> <p><b>Theory Duration</b> (hh:mm)</p>	<ul style="list-style-type: none"> <li>• Explain the importance of personal protective equipment (PPE) required for gas cutting operation</li> <li>• State the causes for accidents</li> </ul>	<p>Training kit (Trainer guide, PowerPoint)</p> <p>Leather gloves,</p>

Sr. No.	Module	Key Learning Outcomes	Equipment Required
	10:00 <b>Practical Duration</b> (hh:mm) 08:00  <b>Corresponding NOS Code</b> CSC/N1335	<ul style="list-style-type: none"> <li>Identify job site hazardous work and state possible causes of risk or accident at the workplace</li> <li>Explain the importance of '5S' at the workplace</li> </ul>	leather apron, welding screen – helmet types, hand screen welding and safety shoes
3	<b>Fire Safety</b>  <b>Theory Duration</b> (hh:mm) 05:00  <b>Practical Duration</b> (hh:mm) 30:00  <b>Corresponding NOS Code</b> CSC/N1335	<ul style="list-style-type: none"> <li>Explain types of fires - Class A, B, C and D</li> <li>Select appropriate fire extinguisher to control fire</li> <li>Use PASS method to operate a fire extinguisher</li> <li>Follow fire safety signs and safe evacuation method in case of a fire</li> <li>Identify the location of assembly point, fire exit, fire alarm</li> <li>Follow reporting procedure in case of a fire</li> </ul>	Training kit (Trainer guide, PowerPoint)  Class A, B, C, D and K fire extinguishers
4	<b>Emergencies, rescue and first aid procedure</b>  <b>Theory Duration</b> (hh:mm) 09:00  <b>Practical Duration</b> (hh:mm) 18:00  <b>Corresponding NOS Code</b> CSC/N1335	<ul style="list-style-type: none"> <li>Follow electrical safety procedures</li> <li>Use approved method to rescue a person from electrocution</li> <li>State the importance of first aid</li> <li>Identify the contents of a first aid kit and their application</li> <li>Administer first aid in case of bleeding, burns, choking, electrical shock, poisoning, etc.</li> <li>Use of CPR process</li> <li>Bandage wounds</li> <li>Explain stages of crisis and crisis management</li> <li>Prepare an incident report</li> </ul>	Training kit (Trainer guide, PowerPoint)  First aid kit with all contents
5	<b>Work effectively with others</b>  <b>Theory Duration</b> (hh:mm) 20:00  <b>Practical Duration</b> (hh:mm) 60:00  <b>Corresponding NOS Code</b> CSC/N1336	<ul style="list-style-type: none"> <li>Explain the importance of team work and team dynamics</li> <li>State 4Cs of working in a team</li> <li>Explain types of communication</li> <li>Apply effective communication technique</li> <li>Overcome barriers to effective communication</li> <li>Demonstrate active listening skills</li> <li>Demonstrate good customer service skills</li> <li>Explain the importance of ethical behaviour in your day-to-day work</li> <li>State the importance of discipline in life</li> </ul>	Training kit (Trainer guide, PowerPoint)

Sr. No.	Module	Key Learning Outcomes	Equipment Required
		and apply the same at workplace	
	<b>Total Duration</b>  <b>Theory Duration</b> <b>84:00</b>  <b>Practical Duration</b> <b>216:00</b>	<b>Unique Equipment Required:</b> Leather aprons, eye protection, overalls, face masks, breathing equipment, various metal samples-steel, copper, brass, cast iron, stainless steel etc., power source, volt meter, AMP meter, temperature recorders/indicators, salt bath, specialised jigs, fixtures etc., Class A, B, C, D and K fire extinguishers, PPE, First aid kit with all contents	

Grand Total Course Duration: **300 Hours, 0 Minutes**

(This syllabus/ curriculum has been approved by [Capital Goods Skill Council](#))



## Trainer Prerequisites for Job role: “Electroplating Operator” mapped to Qualification Pack: “CSC/Q0701 v1.0”

Sr. No.	Area	Details
1	<b>Description</b>	Perform a range of electroplating operations on ferrous and non-ferrous metals and alloys.
2	<b>Personal Attributes</b>	Basic communication, numerical and computational abilities. Openness to learning, ability to plan and organize own work and identify and solve problems in the course of working. Understanding the need to take initiative and manage self and work to improve efficiency and effectiveness
3	<b>Minimum Educational Qualifications</b>	Diploma /Degree in Mechanical Engineering
4a	<b>Domain Certification</b>	Certified for Job Role: “Electroplating Operator” mapped to QP: “CSC/Q0701, v1.0”. Minimum accepted score is 80%
4b	<b>Platform Certification</b>	Recommended that the Trainer is certified for the Job Role: “Trainer”, mapped to the Qualification Pack: “MEP/Q0102”. Minimum accepted as per respective SSC guidelines is 80%.
5	<b>Experience</b>	<ul style="list-style-type: none"> <li>3-4 years of industry experience in the relevant field</li> <li>3-4 years of teaching experience</li> </ul>

### Annexure: Assessment Criteria

<b>Assessment Criteria</b>	
<b>Job Role</b>	<b>Electroplating Operator</b>
<b>Qualification Pack</b>	<b>CSC/Q0701, v1.0</b>
<b>Sector Skill Council</b>	<b>Capital Goods Skill Council</b>

<b>Sr. No.</b>	<b>Guidelines for Assessment</b>
1	Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Performance Criteria (PC) will be assigned marks proportional to its importance in NOS. SSC will also lay down proportion of marks for Theory and Skills Practical for each PC.
2	The assessment for the theory part will be based on knowledge bank of questions created by the SSC.
3	Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training center (as per assessment criteria below)
4	Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/training center based on this criteria.
5	To pass the Qualification Pack , every trainee should score a minimum of 70% in every NOS.
6	In case of successfully passing only certain number of NOS's, the trainee is eligible to take subsequent assessment on the balance NOS's to pass the Qualification Pack.

Assessable Outcome	Assessment Criteria	Total Mark (300)	Out Of	Marks Allocation	
				Theory	Skills Practical
<b>1.CSC/N0701 Perform electroplating operations on ferrous and non-ferrous metal alloys</b>	PC1.comply with health and safety, environmental and other relevant regulations and guidelines at work and ensure process compliance	<b>100</b>	3	1	2
	PC2.adhere to procedures or systems in place for risk assessment, occupational standards, personal protective equipment (PPE) and other relevant occupational safety regulations		4	1	3
	PC3.work following laid down procedures and Instructions		3	1	2
	PC4.ensure that all tools, equipment, power tool cables, extension leads are in a safe and usable condition and are kept at secured location		2	0	2
	PC5.ensure work area is clean and safe from hazards before and after the job is completed		2	0	2
	PC6.identify the electroplating requirements from various job specifications documents		2	0	2
	PC7.follow job instructions and electroplating specifications, requirements and procedures at all Times		3	1	2
	PC8.carry out handling/jigging of the Component		3	0	3
	PC9.check that the equipment is ready for the heat treatment operations being performed		3	0	3
	PC10.ensure that the equipment is correctly prepared for the electroplating operations being Performed		2	0	2
	PC11.identify the materials and required electroplating treatment		2	0	2
	PC12.check materials and racking arrangement for non-conformance to specifications/job requirements		4	1	3
	PC13.check all equipment relevant to process for compliance with safety and operational requirements		3	1	2
	PC14.check if the instrumentation/gauges are ready for operation		2	0	2
	PC15.prepare the solution as required by the Process		3	0	3
	PC16.prepare the work surfaces of the components for electroplating by carrying out the appropriate treatment		3	0	3
	PC17.check that the surface treatment equipment and solutions are set up and maintained at satisfactory operating conditions and levels		3	0	3
	PC18.check that the components are correctly prepared for the required treatment activities (eg. dry at the correct temperature, correctly masked)		4	1	3
	PC19.position and fix the location of the		4	1	3

Assessable Outcome	Assessment Criteria	Total Mark (300)	Out Of	Marks Allocation	
				Theory	Skills Practical
	component using an appropriate method as per Availability				
	PC20.load components safely into the treatment plant/solutions		3	0	3
	PC21.monitor and adjust settings such as voltage, current and temperature within permissible limits		5	2	3
	PC22.ensure that components are left for the required induction period		2	0	2
	PC23.remove the components from the plant/solution safely and correctly		3	0	3
	PC24.apply appropriate post treatment activities		4	0	4
	PC25.check that the finished surface achieves the required characteristics and meets the treatment specification		6	2	4
	PC26.carry out quenching/cooling of the components, using the appropriate medium and Technique		5	1	4
	PC27.carry out visual inspection and physical examination of the electroplated component if it is as per specification and without defects		5	1	4
	PC28.deal promptly and effectively with problems within control, and seek help and guidance from the relevant people for problems that cannot be resolved		3	0	3
	PC29.shut down the electroplating equipment to a safe condition on completion of the activities		2	0	2
	PC30.clean all tools and equipment on completion of the electroplating activities		2	0	2
	PC31.dispose of waste and excess materials in line with agreed organizational procedures		3	1	2
	PC32.leave the work area in a safe and tidy condition on completion of the fitting activities		2	0	2
	<b>Total</b>		<b>100</b>	<b>15</b>	<b>85</b>
<b>2.CSC/N1335 Use basic health and safety practices at the workplace</b>	PC1.use protective clothing/equipment for specific tasks and work conditions	<b>100</b>	5	2	3
	PC2.state the name and location of people responsible for health and safety in the workplace		3	1	2
	PC3.state the names and location of documents that refer to health and safety in the workplace		3	1	2
	PC4.identify job-site hazardous work and state possible causes of risk or accident in the workplace		5	2	3
	PC5.carry out safe working practices while dealing with hazards to ensure the safety of self and others state methods of accident prevention in the work environment of the job role		4	2	2
	PC6.state location of general health		3	2	1

Assessable Outcome	Assessment Criteria	Total Mark (300)	Out Of	Marks Allocation	
				Theory	Skills Practical
	and safety equipment in the workplace				
	PC7.inspect for faults, set up and safely use steps and ladders in general use		5	2	3
	PC8.work safely in and around trenches, elevated places and confined areas		5	2	3
	PC9.lift heavy objects safely using correct procedures		5	2	3
	PC10.apply good housekeeping practices at all times		4	2	2
	PC11.identify common hazard signs displayed in various areas		5	2	3
	PC12.retrieve and/or point out documents that refer to health and safety in the workplace		3	1	2
	PC13.use the various appropriate fire extinguishers on different types of fires correctly		4	1	3
	PC14.demonstrate rescue techniques applied during fire hazard		4	1	3
	PC15.demonstrate good housekeeping in order to prevent fire hazards		3	1	2
	PC16.demonstrate the correct use of a fire extinguisher		4	1	3
	PC17.demonstrate how to free a person from electrocution		4	1	3
	PC18.administer appropriate first aid to victims where required eg. in case of bleeding, burns, choking, electric shock, poisoning etc.		4	1	3
	PC19.demonstrate basic techniques of bandaging		3	1	2
	PC20.respond promptly and appropriately to an accident situation or medical emergency in real or simulated environments		4	1	3
	PC21.perform and organize loss minimization or rescue activity during an accident in real or simulated environments		3	1	2
	PC22.administer first aid to victims in case of a heart attack or cardiac arrest due to electric shock, before the arrival of emergency services in real or simulated cases		3	1	2
	PC23.demonstrate the artificial respiration and the CPR Process		3	1	2
	PC24.participate in emergency procedures		3	2	1

Assessable Outcome	Assessment Criteria	Total Mark (300)	Out Of	Marks Allocation	
				Theory	Skills Practical
	PC25.complete a written accident/incident report or dictate a report to another person, and send report to person responsible		4	1	3
	PC26.demonstrate correct method to move injured people and others during an emergency		4	1	3
	<b>Total</b>		<b>100</b>	<b>36</b>	<b>64</b>
<b>3.CSC/N1336 Work effectively with others</b>	PC1.accurately receive information and instructions from the supervisor and fellow workers, getting clarification where required	<b>100</b>	10	3	7
	PC2.accurately pass on information to authorized persons who require it and within agreed timescale and confirm its receipt		10	3	7
	PC3.give information to others clearly, at a pace and in a manner that helps them to understand		10	3	7
	PC4.display helpful behavior by assisting others in performing tasks in a positive manner, where required and possible		10	3	7
	PC5.consult with and assist others to maximize effectiveness and efficiency in carrying out tasks		10	3	7
	PC6.display appropriate communication etiquette while working		10	3	7
	PC7.display active listening skills while interacting with others at work		10	3	7
	PC8.use appropriate tone, pitch and language to convey politeness, assertiveness, care and professionalism		10	3	7
	PC9.demonstrate responsible and disciplined behaviors at the workplace		10	3	7
	PC10.escalate grievances and problems to appropriate authority as per procedure to resolve them and avoid conflict		10	3	7
	<b>Total</b>		<b>100</b>	<b>30</b>	<b>70</b>
	<b>Grand Total</b>		<b>300</b>	<b>81</b>	<b>219</b>
	<b>Percentage Weightage:</b>			<b>27</b>	<b>73</b>
	<b>Minimum Pass% to qualify (aggregate):</b>			<b>70</b>	