

Model Curriculum

Operator – Plate Bending Machine

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/Q0112, 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: **'Operator – Plate Bending Machine'** QP No. **'CSC/Q 0112, NSQF Level 2'**

Date of Issuance: April 24th, 2014

Valid up to : August 30th, 2016

Head up to the right corner side of the Qualification Pack is the
valid up to date (non-renewable certificate is valid)



Authorised Signatory
Tourism & Hospitality Skill Council

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Operator-Plate Bending Machine

CURRICULUM / SYLLABUS

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

Program Name	Operator-Plate Bending Machine		
Qualification Pack Name & Reference ID. ID	CSC/Q0112, v1.0		
Version No.	1.0	Version Update Date	
Pre-requisites to Training	8 th Standard Pass		
Training Outcomes	<p>After completing this programme, participants will be able to:</p> <ul style="list-style-type: none"> • Perform electroplating operations on ferrous and non-ferrous metals and alloys: bending and forming operations on metal plates of 2mm or more thickness using power operated equipment such as press brakes, bending machines and power presses in accordance with approved procedures. • Basic health and safety practices at the workplace: identify risks and hazards at workplace, use of PPE, and apply good housekeeping practices, etc., • Work effectively with others: effectively communicate with others and demonstrate good ethical practices and discipline. 		

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

Sr. No.	Module	Key Learning Outcomes	Equipment Required
1	<p>Perform plate bending and forming operations using press brakes, bending machines and power presses</p> <p>Theory Duration (hh:mm) 40:00</p> <p>Practical Duration (hh:mm) 100:00</p> <p>Corresponding NOS Code CSC/N0112</p>	<ul style="list-style-type: none"> • Interpret first angle and third angle engineering drawings • Explain various systems of measurement and convert one system of measurement to another • Explain the principle and necessity of bending • Describe the importance of Tolerancing • Explain the principle of bending • Define terminologies used in the bending operations • Identify main parts of manual and power- assisted bending machine • Explain the functioning of manual and power- assisted bending machine • List various work holding methods and devices used in the bending operation • Identify ferrous and non-ferrous materials – mild steel, stainless steel, aluminium • Explain mechanical properties of metals with regard to bending • Prepare the work area for the bending operation as per the standard operating procedure • Prepare the material for bending <ul style="list-style-type: none"> ○ The material should be free from foreign objects or other contamination • Inspect the bending machine for the proper functioning • Prepare for the bending operation <ul style="list-style-type: none"> ○ Interpret job specifications ○ Identify any potential hazards and take necessary actions to avoid hazards ○ Gather required Personal Protective Equipment (PPE) ○ Wear suggested Personal Protective Equipment correctly ○ Select right machine for bending ○ Ensure that machine guards and safety devices are in position and functioning properly ○ Adjust parameters as per the type and thickness of the material being bent • Mark out specified features on the component being bent 	<p>Training kit (Trainer guide, PowerPoint), job instruction sheet /job card, samples of ferrous and non-ferrous metals, power operated bending machines, pneumatic or magnetic table, angle plate, vee block, fixtures, 3 or 4 jaw chuck, ancillary indexing device, jigs , Personal Protective Equipment (PPE)</p>

Sr. No.	Module	Key Learning Outcomes	Equipment Required
		<ul style="list-style-type: none"> Adjust the bending tool to the machine tool holding device as per the operation Position and secure work holding devices Produce range of bends using power operated bending machine <ul style="list-style-type: none"> Bends at 90 degrees Bends of various bend radii Forms Box square and rectangular sections Plate edge Curved sections Carryout dimensional check as per the work instruction Shut down the equipment as per the procedure Fill up appropriate technical forms, process charts and activity logs Perform numerical operations and calculations Identify various basic, compound, and solid shapes Demonstrate problem solving abilities Seek necessary guidance from the relevant people in the organization Communicate with co-workers and supervisors politely and clearly Manage time effectively Work in a team to achieve better results 	
2	<p>Health and safety</p> <p>Theory Duration (hh:mm) 10:00</p> <p>Practical Duration (hh:mm) 08:00</p> <p>Corresponding NOS Code CSC/N1335</p>	<ul style="list-style-type: none"> Explain the importance of personal protective equipment (PPE) required for gas cutting operation State the causes for accidents Identify job site hazardous work and state possible causes of risk or accident at the workplace Explain the importance of '5S' at the workplace 	<p>Training kit (Trainer guide, PowerPoint)</p> <p>Personal Protective Equipment (PPE)</p>
3	<p>Fire Safety</p> <p>Theory Duration (hh:mm) 05:00</p> <p>Practical Duration (hh:mm)</p>	<ul style="list-style-type: none"> Explain types of fires - Class A, B, C and D Select appropriate fire extinguisher to control fire Use PASS method to operate a fire extinguisher Follow fire safety signs and safe evacuation method in case of a fire Identify the location of assembly point, fire exit, fire alarm 	<p>Training kit (Trainer guide, PowerPoint)</p> <p>Class A, B, C, D and K fire extinguishers</p>

Sr. No.	Module	Key Learning Outcomes	Equipment Required
	30:00 Corresponding NOS Code CSC/N1335	<ul style="list-style-type: none"> Follow reporting procedure in case of a fire 	
4	Emergencies, rescue and first aid procedure Theory Duration (hh:mm) 09:00 Practical Duration (hh:mm) 18:00 Corresponding NOS Code CSC/N1335	<ul style="list-style-type: none"> Follow electrical safety procedures Use approved method to rescue a person from electrocution State the importance of first aid Identify the contents of a first aid kit and their application Administer first aid in case of bleeding, burns, choking, electrical shock, poisoning, etc. Use of CPR process Bandage wounds Explain stages of crisis and crisis management Prepare an incident report 	Training kit (Trainer guide, PowerPoint) First aid kit with all contents
5	Work effectively with others Theory Duration (hh:mm) 20:00 Practical Duration (hh:mm) 60:00 Corresponding NOS Code CSC/N1336	<ul style="list-style-type: none"> Explain the importance of team work and team dynamics State 4Cs of working in a team Explain types of communication Apply effective communication technique Overcome barriers to effective communication Demonstrate active listening skills Demonstrate good customer service skills Explain the importance of ethical behaviour in your day-to-day work State the importance of discipline in life and apply the same at workplace 	Training kit (Trainer guide, PowerPoint)
	Total Duration Theory Duration 84:00 Practical Duration 216:00	Unique Equipment Required: Power operated bending machines, pneumatic or magnetic table, angle plate, vee block, fixtures, 3 or 4 jaw chuck, ancillary indexing device, jigs, Personal Protective Equipment (PPE), Class A, B, C, D and K fire extinguishers, 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: “Operator- Plate Bending Machine” mapped to Qualification Pack: “CSC/Q0112 v1.0”

Sr. No.	Area	Details
1	Description	Bending and forming operations on metal plates of 3mm or more thickness using power operated equipment such as press brakes, bending machines and power presses.
2	Personal Attributes	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	Minimum Educational Qualifications	Diploma /Degree in Mechanical Engineering
4a	Domain Certification	Certified for Job Role: “Operator-Plate Bending Machine” mapped to QP: “CSC/Q0112, v1.0”. Minimum accepted score is 80%
4b	Platform Certification	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	Experience	<ul style="list-style-type: none"> • 3-4 years of industry experience in the relevant field • 3-4 years of teaching experience

Annexure: Assessment Criteria

Assessment Criteria	
Job Role	Operator-Plate Bending Machine
Qualification Pack	CSC/Q0112, v1.0
Sector Skill Council	Capital Goods Skill Council

Sr. No.	Guidelines for Assessment
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
1.CSC/N0112 Perform plate bending and forming operations using press brakes, bending machines and power presses	PC1.comply with health and safety, environmental and other relevant regulations and guidelines at work	100	3	1	2
	PC2.adhere to procedures and guidelines for personal protective equipment (PPE) and other relevant safety regulations while performing plate bending and forming operations		4	1	3
	PC3.work following laid down procedures and Instructions		3	1	2
	PC4.ensure work area is clean and safe from Hazards		2	0	2
	PC5.ensure that all tools and equipment are in a safe and usable condition		2	0	2
	PC6.obtain job specification from a valid and approved source		2	0	2
	PC7.read and interpret first and third angle Drawings		3	0	3
	PC8.establish job requirements from the job specification document accurately		3	1	2
	PC9.report and rectify incorrect and inconsistent information in job specification documents as per organization procedures		4	1	3
	PC10.prepare the work area for the turning operations as per procedure or operational specification		3	1	2
	PC11.obtain correct work pieces/raw materials and consumables as per job requirements		3	1	2
	PC12.ensure that the work pieces/raw materials used are free from foreign objects, dirt or other contamination and duly prepared as required		3	1	2
	PC13.conduct a preliminary check of the readiness of the bending or forming machine		3	0	3
	PC14.obtain all the tools and equipment required for the bending operation		2	0	2
	PC15.confirm that the equipment is set up correctly and is ready for use		2	0	2
	PC16.seek necessary instruction/training on the operation of the machine where required from appropriate sources		3	0	3
	PC17.ensure that machine settings are adjusted as per requirement		3	1	2
	PC18.mark out specified features for plate bending and forming on the work pieces as per job specification using appropriate measuring and marking out tools and equipment		5	1	4
	PC19.trace/transfer the specified features from the templates onto the work pieces as per job		5	1	4

Assessable Outcome	Assessment Criteria	Total Mark (300)	Out Of	Marks Allocation	
				Theory	Skills Practical
	Specification				
	PC20.set-up the power operated machine for bending operations to produce a range of bends		4	0	4
	PC21.adjust the bending tool to the machine tool holding device as per the operation.		5	1	4
	PC22.use the correct methods of moving or lifting sheet or plate materials		5	1	4
	PC23.position and secure work holding devices		4	0	4
	PC24.carry out quality sampling checks at suitable intervals		4	0	4
	PC25.perform checks on the components before removing them from the machine		4	0	4
	PC26.measure and compare the dimensions of the bends with the specification allowing for tolerances using appropriate tools and equipment		4	0	4
	PC27.produce components as per the job specifications		5	1	4
	PC28.ensure that the quality control procedures are used while operating the equipment		2	0	2
	PC29.deal promptly and effectively with problems within their control and report those that cannot be solved		3	0	3
	PC30.shut down the equipment to a safe condition at the end of machining		2	0	2
	Total		100	14	86
2.CSC/N1335 Use basic health and safety practices at the workplace	PC1.use protective clothing/equipment for specific tasks and work conditions	100	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 and safety equipment in the workplace		3	2	1
	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		5	2	3

Assessable Outcome	Assessment Criteria	Total Mark (300)	Out Of	Marks Allocation	
				Theory	Skills Practical
	correct procedures				
	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
	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
	Total		100	36	64

Assessable Outcome	Assessment Criteria	Total Mark (300)	Out Of	Marks Allocation	
				Theory	Skills Practical
3.CSC/N1336 Work effectively with others	PC1.accurately receive information and instructions from the supervisor and fellow workers, getting clarification where required	100	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
Total		100	30	70	
Grand Total		300	80	220	
Percentage Weightage:			27	73	
Minimum Pass% to qualify (aggregate):			70		