Model Curriculum

Plasma Cutter-Manual

SECTOR:	**CAPITAL GOODS**
SUB-SECTOR:	**1. Machine Tools**
	2. Dies, Moulds and Press Tools
	3. Plastics Manufacturing Machinery
	4. Textile Manufacturing Machinery
	5. Process Plant Machinery
	6. Electrical and Power Machinery
	7. Light Engineering Goods
OCCUPATION:	**Welding and Cutting**
REF ID:	**CSC/Q0207, v1.0**
NSQF LEVEL:	**3**

Skill India
कौशल भारत-कुशल भारत

CGSC
CAPITAL GOODS SKILL COUNCIL

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National
Skill Development
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Transforming the skill landscape

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: **'Plasma Cutter - Manual'** QP No. **'CSC/ Q 0207, NSQF Level 3'**

Date of Issuance: Nov 24th, 2017

Valid up to : Nov 24th, 2021

**Valid up to the next review date of the Qualification Pack or the 'Valid up to' date mentioned above (whichever is earlier)*

Authorised Signatory
(Capital Goods Skill Council)

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Plasma Cutter-Manual

CURRICULUM / SYLLABUS

This program is aimed at training candidates for the job of a "Plasma Cutter-Manual", in the "Capital Goods" Sector/Industry and aims at building the following key competencies amongst the learner.

Program Name	**Plasma Cutter-Manual**		
Qualification Pack Name & Reference ID. ID	CSC/Q0207, v1.0		
Version No.	1.0	**Version Update Date**	24/11/2017
Pre-requisites to Training	8th Standard passed, preferably		
Training Outcomes	**After completing this programme, participants will be able to:** • Manually cut materials • Use basic health and safety practices at the workplace • Work effectively with others		

This course encompasses 3 out of 3 National Occupational Standards (NOS) of "Plasma Cutter-Manual" Qualification Pack issued by "Capital Goods Skill Council".

Sr. No.	Module	Key Learning Outcomes	Equipment Required
1	**Manually Cut Metal Materials using Plasma arc** **Theory Duration** (hh:mm) 40:00 **Practical Duration** (hh:mm) 100:00 **Corresponding NOS Code** CSC/N0207	• List various systems of measurement • Explain principles of plasma arc cutting • Define common terminologies used in the plasma cutting • Extract information from engineering drawings and related specifications • Explain transferred and non transferred welding • Identify cutting equipment and types of consumables used • List various plasma arc gases • dentify various parts of handheld plasma cutting equipment • Explain the use of low and high pressure regulators • Explain the use of single stage and two stage regulators • Explain the procedure selecting nozzles based on type and thickness of the base material • Identify various work holding devices used in plasma arc cutting • Demonstrate safety precautions to be taken while performing plasma arc cutting • Identify Personal Protective Equipment (PPE) required for plasma arc cutting • Identify hazards associated with plasma arc cutting and explain actions to be taken to minimise such hazards • Comply with health and safety regulations all the times • Interpret cutting procedure data sheet specifications • Setup the plasma arc cutting equipment • Check for leakages from regulators, hoses and check valves • Set the amperage and gas pressure as per metal thickness, metal type and type of gas • Follow recommended procedure for lighting, adjusting and extinguishing the fire • Gather required equipment for plasma arc cutting • Perform various cutting operations • Identify possible defects and take corrective measures to such defects • Verify dimensions, tolerances as per the work sheet • Communicate any problems to the	Training kit (Trainer guide, PowerPoint) Plasma arc cutting equipment with all accessories (Plasma power source, pilot arc ignition system, torch, portable straight line cutter, profile cutter, air filter with regulator, burner, electrode, compressor, nozzle, electrode holder, contact tube, front cap, gas supply system with gauges, cooling system, earthing clamp, connecting leads and cables), apron, gloves, safety boots, overalls, eye shields, goggles, ear plugs, measuring instruments, Cutting table 822 cm x 92 cm x 60 cm, Surface plate, Scriber, Dividers, Calliper outside, Prick punch, Chisel cold flat, Centre punch, steel Rule, Hammer Scaling, Vernier Caliper _Digital, Ball peen hammer, holding tongs, wire brush, double ended spanner set, spade guides, radius guide, bevel guide

Sr. No.	Module	Key Learning Outcomes	Equipment Required
		immediate supervisor • Shut down the equipment correctly and as per the standard recommendations • Carry out required documentation as per the company policy • Communicate with people in respectful manner in line with organizational protocol • Perform numerical calculations • Demonstrate problem solving abilities • Plan sequence of operations correctly • Manage own time for achieving better results	
2	**Health and safety** **Theory Duration** (hh:mm) 10:00 **Practical Duration** (hh:mm) 08:00 **Corresponding NOS Code** CSC/N1335	• Explain the importance of Personal Protective Equipment (PPE) State the causes for accidents • Identify job site hazards and state possible causes of risk or accident at the workplace • Explain the importance of '5S' at the workplace	Training kit (Trainer guide, PowerPoint) Leather gloves, leather apron, welding screen – helmet types, hand screen welding and safety shoes
3	**Fire Safety** **Theory Duration** (hh:mm) 05:00 **Practical Duration** (hh:mm) 30:00 **Corresponding NOS Code** CSC/N1335	• Explain types of fires • Recognise required fire extinguisher based on the type of fire • Apply 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 • Follow reporting procedure in case of a fire	Training kit (Trainer guide, PowerPoint) Class A, B, C, D and K fire extinguishers
4	**Emergencies, rescue and first aid procedure** **Theory Duration** (hh:mm) 09:00 **Practical Duration** (hh:mm) 18:00 **Corresponding NOS Code**	• 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. • Demonstrate CPR process • Explain stages of crisis and crisis management	Training kit (Trainer guide, PowerPoint) First aid kit with all contents

Sr. No.	Module	Key Learning Outcomes	Equipment Required
	CSC/N1335	• Prepare an Incident report	
5	**Work effectively with others** **Theory Duration** (hh:mm) 20:00 **Practical Duration** (hh:mm) 60:00 **Corresponding NOS Code** CSC/N1336	• 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:** CNC Controlled Vertical Machining Center – 3 axis, allen keys, Plasma arc cutting equipment with all accessories (Plasma power source, pilot arc ignition system, torch, portable straight line cutter, profile cutter, air filter with regulator, burner, electrode, compressor, nozzle, electrode holder, contact tube, front cap, gas supply system with gauges, cooling system, earthing clamp, connecting leads and cables), apron, gloves, safety boots, overalls, eye shields, goggles, ear plugs, measuring instruments, Cutting table 822 cm x 92 cm x 60 cm, Surface plate, Scriber, Dividers, Calliper outside, Prick punch, Chisel cold flat, Centre punch, steel Rule, Hammer Scaling, Vernier Caliper _Digital, Ball peen hammer, holding tongs, wire brush, double ended spanner set, spade guides, radius guide, bevel guide, 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: "Plasma cutter-manual" mapped to Qualification Pack: "CSC/Q0207 v1.0"

Sr. No.	Area	Details
1	**Description**	Setting of computer numerically controlled (CNC) vertical machining machines (VMC) in order to perform machining operations on metal components, as per specifications provided.
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: "Plasma cutter-Manual" mapped to QP: CSC/Q0123, 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**	• 3-4 years of industry experience in the relevant field • 3-4 years of teaching experience

Annexure: Assessment Criteria

Criteria For Assessment Of Trainees

Job Role: Plasma Cutter-Manual

Qualification Pack: CSC/Q0207

Sector Skill Council: Capital Goods Skill Council

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. Assessment will be conducted for all compulsory NOS, and where applicable, on the selected elective/option NOS/set of NOS.
4. Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training centre (as per assessment criteria below).
5. Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/training centre based on this criterion.
6. To pass the Qualification Pack, every trainee should score a minimum of 70% of aggregate marks to successfully clear the assessment.
7. In case of *unsuccessful completion*, the trainee may seek reassessment on the Qualification

Compulsory NOS Total Marks: 300				Marks Allocation	
Assessment outcomes	**Assessment Criteria for outcomes**	**Total Marks**	**Out of**	**Theory**	**Skills Practical**
CSC/N0207 Manually cut metal materials using plasma arc	PC1.work safely at all times, complying with health and safety legislation, regulations and other relevant guidelines	**100**	3	1	2
	PC2.take necessary safety precautions for plasma cutting operations including equipment, processes and checks		3	1	2
	PC3.interpret cutting procedure data sheets specifications		3	1	2
	PC4.check regulators, hoses and check that valves are securely connected and free from leaks and damage		3	1	2
	PC5.check equipment is calibrated and approved for use		2	0	2
	PC6.check/fit the correct nozzle to the torch		3	1	2
	PC7.match correct tips and cups to the torch as per requirement and manufacturer's equipment instructions		2	0	2

	PC8.set the amperage and gas pressure as per metal thickness, metal type, and type of gas		2	0	2
	PC9.use the correct procedure for lighting, adjusting and extinguishing the arc		3	1	2
	PC10.use appropriate and safe procedures for handling and storing of gas cylinders		3	1	2
	PC11.prepare the work area for the cutting activities		3	1	2
	PC12.obtain the appropriate tools and equipment for the plasma arc cutting operations, and check that they are in a safe and usable condition		3	1	2
	PC13.check that the plasma arc cutting equipment is correctly set up for the operations to be performed		2	0	2
	PC14.carry out correct measurements required using appropriate equipment and methods for planning the cut		4	1	3
	PC15.where appropriate, mark out the components for the required operations, using appropriate tools and techniques		3	1	2
	PC16.perform trial cut to check for cut defect		3	1	2
	PC17.operate the plasma cutting equipment to produce items/cut shapes to the dimensions and profiles as specified		5	1	4
	PC18.use the correct angles to cut and the right speed		4	1	3
	PC19.use various types of plasma arc cutting methods/techniques		4	1	3
	PC20.perform various cutting operations correctly		4	1	3
	PC21.produce thermal cuts in various forms of material Forms: plate, rolled section, pipe/tube, solid bars		4	1	3
	PC22.produce cut profiles for various type of materials Materials type: mild steel; high alloy steel; stainless steel; aluminium and its alloys; other appropriate metal		3	0	3
	PC23.produce thermally-cut components which meet specified quality criteria		4	1	3
	PC24.detect and correct defects in cut		3	1	2
	PC25.leave the work area in a safe and tidy condition on completion of the cutting activities		2	0	2
	PC26.check that the finished components meet the required standard		3	1	2
	PC27.use appropriate methods and equipment to check the quality, and that all dimensional and geometrical aspects of the cut material are to the specification		4	2	2
	PC28.identify various cutting defects		3	1	2
	PC29.report any difficulties or problems that may arise with the cutting activities, and carry out any agreed actions		3	1	2

	PC30.detect equipment malfunctions and deal with them appropriately		2	0	2
	PC31.deal promptly and effectively with problems within their control, and seek help and guidance from the relevant people if they have problems that they cannot resolve		3	1	2
	PC32.shut down and make safe the cutting equipment on completion of the cutting activities or during an emergency		2	0	2
	PC33.follow standard emergency procedures in case of emergencies		2	0	2
		Total	**100**	**25**	**75**
CSC/N1335 Use basic health and safety practices at the workplace	PC1.use protective clothing/equipment for specific tasks and work conditions	100	4	1	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		4	2	2
	PC6.state methods of accident prevention in the work environment of the job role		3	2	1
	PC7.state location of general health and safety equipment in the workplace		5	2	3
	PC8.inspect for faults, set up and safely use steps and ladders in general use		5	2	3
	PC9.work safely in and around trenches, elevated places and confined areas		5	2	3
	PC10.lift heavy objects safely using correct procedures		4	2	2
	PC11.apply good housekeeping practices at all times		5	2	3
	PC12.identify common hazard signs displayed in various areas		3	1	2
	PC13.retrieve and/or point out documents that refer to health and safety in the workplace		4	1	3
	PC14.use the various appropriate fire extinguishers on different types of fires correctly		3	1	2
	PC15.demonstrate rescue techniques applied during fire hazard		3	1	2
	PC16.demonstrate good housekeeping in order to prevent fire hazards		4	1	3
	PC17.demonstrate the correct use of a fire extinguisher		4	1	3
	PC18.demonstrate how to free a person from electrocution		4	1	3

	PC19.administer appropriate first aid to victims where required eg. in case of bleeding, burns, choking, electric shock, poisoning etc.		3	1	2
	PC20.demonstrate basic techniques of bandaging		3	1	2
	PC21.respond promptly and appropriately to an accident situation or medical emergency in real or simulated environments		3	1	2
	PC22.perform and organize loss minimization or rescue activity during an accident in real or simulated environments		3	1	2
	PC23.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
	PC24.demonstrate the artificial respiration and the CPR Process		3	1	2
	PC25.participate in emergency procedures		4	1	3
	PC26.complete a written accident/incident report or dictate a report to another person, and send report to person responsible		3	1	2
	PC27.demonstrate correct method to move injured people and others during an emergency		4	2	2
		Total	**100**	**36**	**64**
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**