

Model Curriculum

Assistant Oxy Fuel Gas Cutter

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/Q0201, 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 CURRICULAM

Complying to National Occupational Standards of

Job Role / Qualification Pack: **'Assistant Oxy Fuel Gas Cutter'** QP No. **'CSC/Qo2o1 NSQF Level 2'**

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 Skills Council)

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Assistant Oxy Fuel Gas Cutter

CURRICULUM / SYLLABUS

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

Program Name	Assistant Oxy Fuel Gas Cutter		
Qualification Pack Name & Reference ID. ID	CSC/Q0201, v1.0		
Version No.	1.0	Version Update Date	24/11/2017
Pre-requisites to Training	5th Standard passed, preferably		
Training Outcomes	After completing this programme, participants will be able to: <ul style="list-style-type: none"> • Perform the cutting operation, and test for accuracy • Deal with contingency • Apply basic health and safety practices at the workplace • Work effectively with others 		

This course encompasses 3 out of 3 National Occupational Standards (NOS) of “Assistant Oxy Fuel Gas Cutter” Qualification Pack issued by “Capital Goods Skill Council”.

Sr. No.	Module	Key Learning Outcomes	Equipment Required
1	<p>Introduction</p> <p>Theory Duration (hh:mm) 03:00</p> <p>Practical Duration (hh:mm) 00:00</p> <p>Corresponding NOS Code Bridge Module</p>	<ul style="list-style-type: none"> Explain various types of cutting process used in the fabrication industry Classify materials as ferrous and non-ferrous materials Describe physical properties of most commonly used ferrous and non-ferrous materials List advantages and disadvantages of various metal cutting methods Explain the principle and application of oxy fuel gas cutting Compare oxy fuel gas welding and cutting 	<p>Training Kit (PowerPoint, Trainer Guide)</p>
2	<p>Safe working practices</p> <p>Theory Duration (hh:mm) 10:00</p> <p>Practical Duration (hh:mm) 02:00</p> <p>Corresponding NOS Code CSC/N0201</p>	<ul style="list-style-type: none"> Explain importance of safe working practices at the work place Apply electrical safety practices at the work place Comply with health and safety legislation, regulations and other guidelines Follow general safety practices at the workplace Identify hazards at the workplace to avoid accidents State the causes of fire Identify Personal Protective Equipment (PPE) required for gas cutting operation Follow the safety recommendations while handling oxy fuel gas set up 	<p>Training kit (Trainer guide, PowerPoint)</p> <p>Leather apron; leather gloves; welding screen – helmet type; hand screen welding; safety shoes; fire extinguisher- dry powder type; fire bucket with sand and first aid kit</p>
3	<p>Preparing for cutting operations</p> <p>Theory Duration (hh:mm) 10:00</p> <p>Practical Duration (hh:mm) 25:00</p> <p>Corresponding NOS Code CSC/N0201</p>	<ul style="list-style-type: none"> Read drawings to interpret specification and cutting procedure Identify oxy fuel gas set up and accessories Identify oxygen and acetylene cylinders by colour coding Connect accessories to oxygen and acetylene cylinders Select right sized nozzle and connect to the torch Check for any leakages in the system Operate pressure regulators and set correct pressure for oxygen and acetylene State the purpose of cutting aids used in gas cutting Explain various types of flames and their application Generate various types of flames by varying the oxygen supply Perform gas cutting using a neutral 	<p>Training kit (Trainer guide, PowerPoint)</p> <p>Oxygen cylinder - 7m³, acetylene cylinder- 6 m³, oxygen pressure regulator; acetylene pressure regulator; flashback arrestors; cutting torch; rubber hoses; cutting nozzles; trolley to secure oxygen and acetylene cylinders; chain to secure</p>

Sr. No.	Module	Key Learning Outcomes	Equipment Required
		flame on a test piece	oxygen and acetylene cylinders; lighter/ flint; spanner set; spindle key; non-return valves; spade guides; radius guide; bevel guide; gas welding/ cutting table 822 cm x 92 cm x 60 cm; surface plate; scribe - 15 cm; dividers 20 cm; calliper outside 15 cm; prick punch; chisel cold flat - 19 mm; centre punch – 9 mm x 127 mm; rule 60 cm; two fold; brass topped to read inches and mm; hammer scaling 0.25 kg with handle; steel rule - 30 cm to read inch and millimetre; Vernier calliper - digital - 0-150 mm; ball peen hammer with handle - 0.25 kg; cross peen hammer with handle - 0.25 kg; holding tongs - 30 cm; wire brush – 15 cm x 3.7 cm and double ended spanner
4	<p>Cutting operation and testing for accuracy</p> <p>Theory Duration (hh:mm) 20:00</p> <p>Practical Duration (hh:mm) 55:00</p>	<ul style="list-style-type: none"> • Read drawing to interpret procedure and cutting tolerance • Select the right sized tip based on the plate thickness to be cut • Check connection of the accessories, and ensure that there is no gas leakage in the system • Perform cutting operation on sheet/ pipe/ tube/ bar/ rod as per the drawing • Produce thermal cuts in low carbon steels 	<p>Training kit (Trainer guide, PowerPoint)</p> <p>Tools and equipment as mentioned above</p>

Sr. No.	Module	Key Learning Outcomes	Equipment Required
	<p>Corresponding NOS Code CSC/N0201</p>	<ul style="list-style-type: none"> State the possible defects that may occur, and take corrective action Measure the cut part for accuracy using suitable measuring tools 	
5	<p>Dealing with contingencies</p> <p>Theory Duration (hh:mm) 05:00</p> <p>Practical Duration (hh:mm) 10:00</p> <p>Corresponding NOS Code CSC/N0201</p>	<ul style="list-style-type: none"> Communicate with superiors regarding malfunctioning of any component in the setup Seek assistance from superiors in case of any difficulty State relevant legislation, standards, policies and procedures followed in the organization Describe the work flow and own role in the work flow Read and interpret information correctly Fill appropriate forms as per the policy Perform numerical calculations Explain the importance of planning and organizing day-to-day activities Evaluate the work for accuracy State the importance of team work 	<p>Training kit (Trainer guide, PowerPoint)</p> <p>Oxy-acetylene gas cutting setup</p>
6	<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) Identify job site hazards to avoid accidents at the work place Explain the importance of '5S' at the workplace 	<p>Training kit (Trainer guide, PowerPoint)</p> <p>Leather gloves, leather apron, welding screen – helmet types, hand screen welding and safety shoes</p>
7	<p>Fire Safety</p> <p>Theory Duration (hh:mm) 05:00</p> <p>Practical Duration (hh:mm) 30:00</p> <p>Corresponding NOS Code CSC/N1335</p>	<ul style="list-style-type: none"> Explain types of fires Recognise required fire extinguisher based on the type of fire Identify causes of accidents Apply PASS method to operate a fire extinguisher Interpret fire safety signs Inspect evacuation plan in case of fire Identify the location of assembly point, fire exit, fire alarm Follow reporting procedure in case of a fire Plan fire safety drills at the workplace 	<p>Training kit (Trainer guide, PowerPoint)</p> <p>Class A, B, C, D and K fire extinguishers</p>
8	<p>Emergencies, rescue and first aid procedure</p>	<ul style="list-style-type: none"> Follow electrical safety procedures Use approved method to rescue a person from electrocution 	<p>Training kit (Trainer guide, PowerPoint)</p>

Sr. No.	Module	Key Learning Outcomes	Equipment Required
	<p>Theory Duration (hh:mm) 09:00</p> <p>Practical Duration (hh:mm) 18:00</p> <p>Corresponding NOS Code CSC/N1335</p>	<ul style="list-style-type: none"> State the importance of first aid Identify the contents of a first aid kit Administer first aid in case of bleeding, burns, choking, electrical shock, poisoning, etc. Demonstrate CPR process Provide first aid for minor injuries Explain stages of crisis and crisis management 	First aid kit with all contents
9	<p>Working effectively with others</p> <p>Theory Duration (hh:mm) 20:00</p> <p>Practical Duration (hh:mm) 60:00</p> <p>Corresponding NOS Code CSC/N1336</p>	<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)
	<p>Total Duration</p> <p>Theory Duration 92:00</p> <p>Practical Duration 208:00</p>	<p>Unique Equipment Required: Leather gloves; leather apron; welding screen - helmet type; hand screen welding; safety shoes; fire extinguishers - dry powder fire extinguisher; fire bucket with sand, first aid kit; gas cutting equipment with all accessories; surface plate - standard size; scribe - 15 cm; dividers 20 cm; calliper outside 15 cm; prick punch; chisel cold flat - 19 mm; centre punch – 9 mm x 127 mm; rule 60 cm; two fold; brass topped to read inches and mm; hammer scaling 0.25 kg with handle; steel rule - 30 cm to read inch and millimetre; Vernier calliper (digital) - 0-150 mm; ball peen hammer with handle - 0.25 kg; cross peen hammer with handle - 0.25 kg; holding tongs - 30 cm; wire brush – 15 cm x 3.7 cm and double ended spanner</p>	

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

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

Trainer Prerequisites for Job role: “Assistant Oxy Fuel Gas Cutter” mapped to Qualification Pack: “CSC/Q0201 v1.0”

Sr. No.	Area	Details
1	Description	Perform manual oxy-fuel cutting for a range of standard cutting job requirements using oxy-fuel gas. This is for a skilled cutter who can cut carbon steels in the basic positions.
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: “Assistant Oxy Fuel Gas Cutter” mapped to QP: “CSC/Q0201, 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

Criteria For Assessment Of Trainees

Job Role: Assistant Oxy Fuel Gas Cutter

Qualification Pack: CSC/Q0201

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 Pack.

Total Marks: 300				Compulsory NOS		Marks Allocation	
Assessment outcomes	Assessment Criteria for outcomes	Total Marks	Out of	Theory	Skills Practical		
CSC/N0201 Perform simple manual cutting operations on carbon steels using oxy-fuel gas	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 gas cutting operations including equipment, processes and checks		3	1	2		
	PC3.interpret cutting procedure data sheets specifications		2	1	1		
	PC5.check equipment is calibrated and approved for use		2	0	2		
	PC6.check the correct size gas nozzle to the torch		3	1	2		
	PC7.ensure preheat and oxygen holes on the tips are clean		2	0	2		
	PC8.check that a flashback arrestor is fitted		2	0	2		

PC9.set appropriate gas pressures	2	0	2
PC10.use the correct procedure for lighting, adjusting and extinguishing the flame Lighting	2	0	2
PC11.adjust torch valve for type of flame such as neutral, carburizing and oxidizing	3	1	2
PC12.follow sequence of operations such as pre-heating material and initiating cut	3	1	2
PC13.check if the locations for cutting have been marked out by authorised persons	2	0	2
PC14.use appropriate and safe procedures for handling and storing of gas cylinders	3	1	2
PC15.prepare the work area for the cutting activities	2	0	2
PC16.obtain the appropriate tools and equipment for the oxy-fuel gas cutting operations, and check that they are in a safe and usable condition	3	1	2
PC17.check that the oxy-fuel gas cutting equipment is set up for the operations to be performed	2	0	2
PC18.adjust cylinder valves and adjust regulator for operating pressure to achieve specifications for required operations	3	0	3
PC19.seek clarification where marking out is not done or is not clear from authorised person	2	0	2
PC20.perform trial cut to check for cut defects	3	1	2
PC21.operate the oxy-fuel gas cutting equipment to produce items/cut shapes to the dimensions and profiles as per instructions given	5	1	4
PC22.use various oxy-fuel gas lighting and cutting procedures	5	1	4
PC23.perform various cutting operations correctly	4	1	3
PC24.produce thermal cuts in low carbon steel (1.5mm to 10mm thickness)	3	0	3
PC25.produce cut profiles for various type of materials and forms	3	1	2
PC26.produce thermally-cut components which meet specified quality criteria	3	1	2

	PC27. recognize and correct burn back and flashback		2	1	1
	PC28. detect and correct defects in cut		3	1	2
	PC29. ensure the work area is left in a safe and tidy condition on completion of the cutting activities		2	0	2
	PC30. check that the finished components meet the standard required		3	1	2
	PC31. use appropriate methods and equipment to check the quality, and that all dimensional and geometrical aspects of the cut material are to the specification		3	1	2
	PC32. identify various cutting defects and follow organisation recommended procedures to address them		3	1	2
	PC33. report any difficulties or problems that may arise with the cutting activities, and carry out any agreed actions		2	0	2
	PC34. detect equipment malfunctions and deal with them appropriately		2	0	2
	PC35. 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		2	0	2
	PC36. shut down and make safe the cutting equipment on completion of the cutting activities		2	0	2
	PC37. follow standard emergency procedures in case of emergencies		4	2	2
		Total	100	21	79
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		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	4	1	3
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	4	1	3
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	2	1
PC25.participate in emergency procedures	2	1	1
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		3	1	2
		Total	100	37	63
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