

Model Curriculum

Resistance Spot Welding Machine 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: Design
REF ID: CSC/Q0206, V1.0
NSQF LEVEL: 3



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: 'Resistance Spot welding Machine Operator' QP No. 'CSC/ Q 0206, NSQF Level 3'

Date of Issuance: April 30th, 2014

Valid up to : August 30th, 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

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Resistance Spot Welding Machine Operator

CURRICULUM / SYLLABUS

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

Program Name	Resistance Spot Welding Machine Operator		
Qualification Pack Name & Reference ID. ID	CSC/Q0206, v1.0		
Version No.	1.0	Version Update Date	
Pre-requisites to Training	10 th standard pass		
Training Outcomes	<p>After completing this programme, participants will be able to:</p> <ul style="list-style-type: none"> • Welding joints using resistance spot welding machines: perform manual operations for performing resistance spot welding and independently carry out resistance spot welding weld operations for welding joints in all positions as per Welding Procedure Specification. • 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 “Resistance Spot Welding Machine Operator” Qualification Pack issued by “Capital Goods Skill Council”.

Sr. No.	Module	Key Learning Outcomes	Equipment Required
1	<p>Welding joints using resistance spot welding machines</p> <p>Theory Duration (hh:mm) 40:00</p> <p>Practical Duration (hh:mm) 100:00</p> <p>Corresponding NOS Code CSC/N0206</p>	<ul style="list-style-type: none"> • State the necessity of welding • Describe various welding processes • Explain the basic principle of resistance welding • Identify key components of a spot welding machine <ul style="list-style-type: none"> ○ Power source ○ Machine frame ○ Welding transformer ○ Welding head ○ Power range etc. • Differentiate between ferrous and non-ferrous material • Describe physical properties of commonly used base metals • State various systems of measurements and convert units from one system of measurement to another • State parameters to be considered for resistance welding • Read fabrication drawings • Explain the necessity of dressing electrode before the welding • Identify workplace hazards and take corrective actions to avoid such hazards • Gather required information from the worksheets/instruction sheets • Explain safety precautions to be followed while performing resistance welding • Check that the equipment is safe for the use <ul style="list-style-type: none"> ○ Condition of power leads ○ No observable physical damage • Check the equipment for proper functioning • Prepare the surface of the base metal to welded using right technique <ul style="list-style-type: none"> ○ Cleaning ○ Drying ○ Pickling ○ Rinsing ○ Passivation • Set up the spot welding machine and adjust parameters • Change tips and wheels as per requirement • Produce welded components which meet all the required quality parameters 	<p>Training kit (Trainer guide, PowerPoint) , Portable spot welding machine, electrode, electrode tip, stationary spot welding machine, fillet gauges, measuring tape, squares, straight edges</p>

Sr. No.	Module	Key Learning Outcomes	Equipment Required
		<ul style="list-style-type: none"> Achieve joints of the required quality and specified dimensional accuracy Support carrying out of destructive and non-destructive tests <ul style="list-style-type: none"> Non Destructive Test (NDT) <ul style="list-style-type: none"> Visual inspection Leak test Destructive Test <ul style="list-style-type: none"> Metallographic Peel test Tensile test Shear test Fatigue test Impact test Carryout required documentation as per company policy Perform numerical operations plan, prioritize and sequence work operations as per job requirement Work in a team in order 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) 30:00</p> <p>Corresponding NOS Code CSC/N1335</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 Follow reporting procedure in case of a fire 	<p>Training kit (Trainer guide, PowerPoint)</p> <p>Class A, B, C, D and K fire extinguishers</p>
4	<p>Emergencies, rescue and first aid procedure</p> <p>Theory Duration</p>	<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 	<p>Training kit (Trainer guide, PowerPoint)</p>

Sr. No.	Module	Key Learning Outcomes	Equipment Required
	(hh:mm) 09:00 Practical Duration (hh:mm) 18:00 Corresponding NOS Code CSC/N1335	<ul style="list-style-type: none"> 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 	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 the workplace 	Training kit (Trainer guide, PowerPoint)
	Total Duration Theory Duration 84:00 Practical Duration 216:00	Unique Equipment Required: Portable spot welding machine, electrode, electrode tip, stationary spot welding machine, fillet gauges, measuring tape, squares, straight edges, 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: “Draughtsman-Piping” mapped to Qualification Pack: “CSC/Q0206 v1.0”

Sr. No.	Area	Details
1	Description	Performing resistance spot welding for a range of standard welding job requirements using machines. This involves setting-up and preparing for operations, interpreting the right information from the WPS, obtaining the right materials, etc.
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: “Draughtsman-Piping” mapped to QP: “CSC/Q0206, 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	Resistance Spot Welding Machine Operator
Qualification Pack	CSC/Q0206, 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/N0206 Welding Joints using resistance spot welding machines	PC1.work safely at all times, complying with health and safety and other relevant regulations and guidelines	100	4	1	3
	PC2.stop machine in case of emergencies and start when safe using correct procedure		3	1	2
	PC3.operate machine safety devices in line with set procedures		3	1	2
	PC4.stop the machine in a timely and safe manner during an emergency		2	0	2
	PC5.interpret resistance weld information from welding procedure data sheets specifications		3	1	2
	PC6.work safely at all times, complying with organizational and other relevant health and safety norms, regulations and guidelines		3	1	2
	PC7.confirm that the resistance spot welding equipment range is fit for purpose		2	0	2
	PC8.ensure all power leads are safe to use, being free from damage and securely Connected		2	0	2
	PC9.check if all equipment and its component systems are in proper working condition and operating correctly		3	0	3
	PC10.check if supplies of components are adequate and suitably prepared for operations		3	0	3
	PC11.ensure welding material surface is appropriately prepared with required surface pre-treatment		2	0	2
	PC12.set up, check, adjust and operate resistance spot welding machines correctly for joining operations to be carried out		3	0	3
	PC13.change tips and wheels as per requirement		2	0	2
	PC14.set up the equipment parameters in accordance with instructions and the welding procedure specifications		6	2	4
	PC15.identify material required according to drawings and specifications		3	1	2
	PC16.select required amount of materials		2	0	2
	PC17.ensure electrodes are of the correct type, size and profile		2	0	2
	PC18.check supplies of components and consumables are adequate and correctly prepared		3	0	3
	PC19.check the installation has been approved for production		2	0	2
	PC20.select and use tools and equipment such as fillet gauges, calculators, measuring tapes, squares and straight edges		3	0	3
	PC21.ensure machine settings comply with instructions and the welding procedure specification		3	1	2

Assessable Outcome	Assessment Criteria	Total Mark (300)	Out Of	Marks Allocation	
				Theory	Skills Practical
	PC22.follow the relevant joining procedure and work instructions		3	1	2
	PC23.carry out and monitor the machine operations in accordance with specifications and job instructions		5	1	4
	PC24.monitor the process operation and make adjustments to parameters, in order to produce welded components covering different components and different material thicknesses		3	0	3
	PC25.achieve joints of the required quality and specified dimensional accuracy		4	1	3
	PC26.produce welded components which meet all the required quality parameters		6	2	4
	PC27.ensure spot welds are correctly pitched out and located		2	0	2
	PC28.meet the required dimensional accuracy within specified tolerances		3	0	3
	PC29.achieve the rate of output as specified		4	1	3
	PC30.support carrying out of destructive and non-destructive tests		3	0	3
	PC31.detect equipment malfunctions and deal with them appropriately		3	0	3
	PC32.deal promptly and effectively with problems within their control and report those that they cannot solve		3	0	3
	PC33.shut down the equipment to a safe condition on conclusion of welding activities		2	0	2
	Total		100	15	85
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		5	2	3

Assessable Outcome	Assessment Criteria	Total Mark (300)	Out Of	Marks Allocation	
				Theory	Skills Practical
	trenches, elevated places and confined areas				
	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
	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		4	1	3

Assessable Outcome	Assessment Criteria	Total Mark (300)	Out Of	Marks Allocation	
				Theory	Skills Practical
	move injured people and others during an emergency				
	Total		100	36	64
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	81	219
	Percentage Weightage:			27	73
	Minimum Pass% to qualify (aggregate):			70	