

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: Welding and Cutting
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: 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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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	24/11/2017
Pre-requisites to Training	10 th standard pass		
Training Outcomes	After completing this programme, participants will be able to: <ul style="list-style-type: none"> • Welding joints using resistance spot welding machines • 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 “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 • 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 • Check the equipment for proper functioning • Prepare the surface of the base metal to welded using right technique • 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 • Achieve joints of the required quality and specified dimensional accuracy • Support carrying out of destructive and non-destructive tests • Document activities as per the policy • Perform numerical operations • Plan, prioritize and sequence work operations as per job requirement • Work in a team in order to achieve better results 	<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>
2	<p>Health and safety practices</p>	<ul style="list-style-type: none"> • Explain the importance of Personal 	<p>Training kit (Trainer guide,</p>

Sr. No.	Module	Key Learning Outcomes	Equipment Required
	<p>Theory Duration (hh:mm) 10:00</p> <p>Practical Duration (hh:mm) 08:00</p> <p>Corresponding NOS Code CSC/N1335</p>	<p>Protective Equipment (PPE)</p> <ul style="list-style-type: none"> Identify job site hazards and take corrective actions to avoid such hazards Explain the importance of '5S' at the workplace 	<p>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 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 	<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 (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"> 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 Provide first aid for minor injuries Explain stages of crisis and crisis management Prepare an Incident report as per the guidelines 	<p>Training kit (Trainer guide, PowerPoint)</p> <p>First aid kit with all contents</p>
5	<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</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 	<p>Training kit (Trainer guide, PowerPoint)</p>

Sr. No.	Module	Key Learning Outcomes	Equipment Required
	Code CSC/N1336	<ul style="list-style-type: none"> 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 	
	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: “Resistance Spot Welding Machine Operator” 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: “ <u>Resistance Spot Welding Machine Operator</u> ” mapped to QP: “ <u>CSC/Q0206, v1.0</u> ”. 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: Resistance Spot Welding Machine Operator

Qualification Pack: CSC/Q0206

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/N0206 Weld 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 type 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 key 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
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
			100	15	85
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