

Model Curriculum

Painting Technician (Spray Painting)

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/Q0702, 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: **'Painting Technician (Spray Painting)'** OP No. **'CSC/Q.0702, NSQF Level 2'**

Date of Issuance: April 30th, 2014

Valid up to : August 30th, 2016

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Head up to the left is the side of the Qualification Pack. (2) The



Authorised Signatory
Tourism & Hospitality Skill Council

TABLE OF CONTENTS

1. Curriculum	01
2. Trainer Prerequisites	06
3. Annexure: Assessment Criteria	07

Painting Technician (Spray Painting)

CURRICULUM / SYLLABUS

This program is aimed at training candidates for the job of a “Painting Technician (Spray Painting)”, in the “Capital Goods” Sector/Industry and aims at building the following key competencies amongst the learner

Program Name	Painting Technician (Spray Painting)		
Qualification Pack Name & Reference ID. ID	CSC/Q0702, v1.0		
Version No.	1.0	Version Update Date	
Pre-requisites to Training	10 th Standard Pass 3 months (preferably 6 months) in painting		
Training Outcomes	<p>After completing this programme, participants will be able to:</p> <ul style="list-style-type: none"> • Perform finishing of materials by applying paints/liquid coatings by spray methods: finishing the material by applying industrial paints/liquid coatings to various substrates using spray methods, 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 “Painting Technician (Spray Painting)” Qualification Pack issued by “Capital Goods Skill Council”.

Sr. No.	Module	Key Learning Outcomes	Equipment Required
1	<p>Perform finishing of materials by applying paints/liquid coatings by spray methods</p> <p>Theory Duration (hh:mm) 40:00</p> <p>Practical Duration (hh:mm) 100:00</p> <p>Corresponding NOS Code CSC/N0702</p>	<ul style="list-style-type: none"> • Identify different kinds of ferrous and non-ferrous metals and state their properties • Explain common terms used in painting and spraying • Identify media used for painting and coating different type of material <ul style="list-style-type: none"> ○ Single pack (air dry) ○ Two-pack material ○ Single pack (Stoving) • Describe specific health and safety precautions to be considered while spray painting <ul style="list-style-type: none"> ○ Specific legislation ○ Authorization ○ Codes of practices • List assessment parameters to assess the suitability of the component for spray painting <ul style="list-style-type: none"> ○ A suitable method of handling ○ Correct method of pre-treatment ○ The correct coating material ○ Efficient and appropriate method of application • Describe the procedure of preparation, mixing and confirmation of the correct parameters of the coating material to be used <ul style="list-style-type: none"> ○ A solid content of the coating material ○ Evaporation of solvents ○ The viscosity of the coating material ○ Correct mixing of paints ○ Particle size and filtration ○ Effect of temperature on viscosity and spraying characteristics ○ Agitation of material being sprayed • List equipment used in spray painting <ul style="list-style-type: none"> ○ Gravity feed ○ Single pressure pot ○ Pumped feeds ○ Manifold supplies ○ Spray gun atomizing and air control ○ Needle settings and caps ○ Electrical ovens • Explain the importance of drying/curing • List various methods of drying/curing 	<p>Training kit (Trainer guide, PowerPoint), mask, paint dress, hand gloves, safety shoes, various types of spray gun, specialized jigs, trays, stirrer, mixer, coat meter test equipment, scratch test equipment, shade test equipment</p>

Sr. No.	Module	Key Learning Outcomes	Equipment Required
		<ul style="list-style-type: none"> ○ Air-drying ○ Induction curing ○ UV curing ○ Thermal curing ○ IR curing • Describe various non-destructive testing procedures <ul style="list-style-type: none"> ○ Coat meter test ○ Scratch test ○ Shade test • Identify various coating defects and describe remedial measures • Follow safety precautions while spray painting • Interpret job specification sheet • Prepare the work area for the painting operation • Identify and obtain various kinds of spray guns, tools and equipment required for spray painting <ul style="list-style-type: none"> ○ Air atomizing unit ○ Electrostatic rotating head manual ○ Air atomizing HVLP ○ Electrostatic air atomizing HVLP ○ Free standing ○ Specialized jigs ○ Trays • Prepare the material for spray painting • Check the condition of the equipment to be used for spray painting • Secure the part correctly using correct work holding devices • Prepare the gun for the painting operation <ul style="list-style-type: none"> ○ Clean flow cup ○ Clean the nozzle ○ Clean the hole • Prepare paint as per requirement and specification • Apply preparatory process to prepare for painting <ul style="list-style-type: none"> ○ Putty preparation and application ○ Primer preparation and application ○ Sanding ○ Rubbing with emery paper ○ Masking ○ Cleaning with thinner etc. • Carry out the coating and painting as per the standard procedure • Check the quality of the painted metal 	

Sr. No.	Module	Key Learning Outcomes	Equipment Required
		<ul style="list-style-type: none"> ○ Thickness ○ Flatness ○ Peeling ○ Shade match etc. ● Perform Non- Destructive Test (NDT) to check the quality of the painting <ul style="list-style-type: none"> ○ Coat meter test ○ Scratch test ○ Shade test ● Disposed waste materials safely as per the organization's standards ● Seek assistance from the competent authority in case of unresolved problems ● Fill up appropriate technical forms, process charts, activity logs etc. ● Communicate with people in respectful form and manner in line with organizational protocol ● Plan, prioritize and sequence work operations as per job requirements ● Work in a team in order to achieve better results ● Identify problems with work planning, procedures, output and behaviour and their implications 	
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>

Sr. No.	Module	Key Learning Outcomes	Equipment Required
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. Use of CPR process Bandage wounds Explain stages of crisis and crisis management Prepare an incident report 	<p>Training kit (Trainer guide, PowerPoint)</p> <p>First aid kit with all contents</p>
5	<p>Work 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 the workplace 	<p>Training kit (Trainer guide, PowerPoint)</p>
	<p>Total Duration</p> <p>Theory Duration 84:00</p> <p>Practical Duration 216:00</p>	<p>Unique Equipment Required: mask, paint dress, hand gloves, safety shoes, various types of spray gun, specialized jigs, trays, stirrer, mixer, coat meter test equipment, scratch test equipment, shade test equipment, Class A, B, C, D and K fire extinguishers, First aid kit with all contents.</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: “Painting Technician (Spray Painting)” mapped to Qualification Pack: “CSC/Q0702 v1.0”

Sr. No.	Area	Details
1	Description	Finishing the material by applying industrial paints/liquid coatings to various substrates using spray methods, in accordance with approved procedures.
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: “Painting Technician (Spray Painting)” mapped to QP: “CSC/Q0702, 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	Painting Technician (Spray Painting)
Qualification Pack	CSC/Q0702, 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/N0702 Perform finishing of materials by applying paints/liquid coating by spray methods	PC1.comply with health and safety, environmental and other relevant regulations and guidelines at work and ensure process compliance	100	3	1	2
	PC2.adhere to procedures or systems in place for risk assessment, occupational standards, personal protective equipment (PPE) and other relevant occupational safety regulations		3	1	2
	PC3.work following laid down procedures and instructions		3	1	2
	PC4.ensure that all tools, equipment, power tool cables, extension leads are in a safe and usable condition and are kept at secured location		2	0	2
	PC5.ensure work area is clean and safe from hazards before and after the job is completed		2	0	2
	PC6.obtain job specification from a valid and approved source		2	0	2
	PC7.read and establish job requirements from the job specification document accurately		3	1	2
	PC8.prepare and maintain the work area as per procedure or operation specification		4	1	3
	PC9.obtain various types of coating materials and consumables required for painting operations through spray as per specifications		3	1	2
	PC10.identify and obtain various kinds of spray guns, tools and equipment required for painting operations as per specifications		3	1	2
	PC11.ensure the material surfaces to be treated are suitably prepared for the finishing operations to be carried out		3	0	3
	PC12.check that the painting equipment is at satisfactory operating conditions		3	0	3
	PC13.position the part correctly for painting		4	0	4
	PC14.prepare the paint gun appropriately		4	1	3
	PC15.adjust air pressure and flow of paint gun as required for the job (size of droplet, width of spray, sprinkle thickness)		4	1	3
	PC16.prepare paint as per requirement and job specification (stirring, mixing hardener, etc.)		5	2	3
	PC17.use correct procedure during preparation activities to cover welded joints (clean with emery, masking machined surface, resin and hardener paste preparation and application, etc.)		6	2	4
	PC18.use preparatory processes to prepare for painting as appropriate (eg. Putty preparation and application, primer preparation and application, sanding, emery, masking, cleaning with thinner, wipes, etc.)		4	1	3
	PC19.check that the finishing equipment and		4	1	3

Assessable Outcome	Assessment Criteria	Total Mark (300)	Out Of	Marks Allocation	
				Theory	Skills Practical
	coatings are set up and maintained at satisfactory operating conditions and levels				
	PC20.carry out the coating and painting process in accordance with operating procedures and the component specification requirements		4	1	3
	PC21.ensure that the painted work-piece achieves the required characteristics and meets the finishing specification		4	2	2
	PC22.check for quality parameters using range of appropriate test		4	1	3
	PC23.dispose waste and excess materials in line with agreed organizational procedures		5	2	3
	PC24.deal promptly and effectively with problems within control, and seek help and guidance from the relevant people for problems that cannot be resolved		3	0	3
	PC25.keep the painting and spraying equipment to a safe condition on completion of the activities		4	1	3
	PC26.leave the work area in a safe and tidy condition on completion of the fitting activities		3	0	3
	PC27.refer unresolved job related problems to appropriate personnel for support		4	1	3
	PC28.monitor the problem and keep the supervisor informed about progress or any delays in resolving the problem		4	0	4
	Total		100	23	77
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

Assessable Outcome	Assessment Criteria	Total Mark (300)	Out Of	Marks Allocation	
				Theory	Skills Practical
	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 move injured people and others during an emergency		4	1	3

Assessable Outcome	Assessment Criteria	Total Mark (300)	Out Of	Marks Allocation	
				Theory	Skills Practical
	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	89	211
	Percentage Weightage:			30	70
	Minimum Pass% to qualify (aggregate):			70	