

Model Curriculum

Polisher- Machine

SECTOR:	CAPITAL GOODS
SUB-SECTOR:	1. Machine Tools 2. Dies, Moulds and Press Tools 3. Plastic Manufacturing Machinery 4. Textile Manufacturing Machinery 5. Process Plant Machinery 6. Electrical and Power Machinery 7. Light Engineering Goods
OCCUPATION:	Machining
REF ID:	CSC/Q0113, 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: '**Polisher-Machine**' QP No. '**CSC/Q0113 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 Skill Council)

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Polisher-Machine

CURRICULUM / SYLLABUS

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

Program Name	Polisher- Machine		
Qualification Pack Name & Reference ID.	CSC/Q0113, v1.0		
Version No.	1.0	Version Update Date	09/01/2019
Pre-requisites to Training	10th Standard passed, preferably		
Training Outcomes	After completing this programme, participants will be able to: <ul style="list-style-type: none"> • Perform polishing on metals and metal alloys with the help of machines. • Apply basic health and safety practices at the workplace. • Work effectively with colleagues and supervisors. 		

This course encompasses 3 out of 3 National Occupational Standards (NOS) of “Polisher-Machine” 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) 0:00</p> <p>Corresponding NOS Code Bridge Module</p>	<ul style="list-style-type: none"> • Explain roles and responsibilities of a machine polisher. • Explain the need for polishing. • Explain common terminologies used in metal polishing. • State features of various mechanical polishing processes. • List various machines used in polishing. • List various parameters impacting the polishing operation. 	<p>Training Kit (Presentations, Trainer Guide).</p>
2	<p>Prepare for polishing operations</p> <p>Theory Duration (hh:mm) 15:00</p> <p>Practical Duration (hh:mm) 50:00</p> <p>Corresponding NOS Code CSC/N0113</p>	<ul style="list-style-type: none"> • List various systems of measurement. • Obtain job specification from a valid and approved source. Valid sources: job instruction sheet/job card, work drawings and instructions, Planning documentation, quality control documents, process specifications, Standard operating procedures, instructions from supervisor. • Interpret work instructions sheet and sequence of operations to be carried out. Job requirements: raw materials or components required (type, quality, quantity); dimensions and surface texture requirements; limits and tolerances; operations required (list, sequence and procedures where applicable); timelines. • List various finishing and polishing methods and techniques. • Interpret grades of polishers and choose right kind of polisher. • State the criterion to choose the appropriate technique. 	<p>Training Kit (Presentations, Trainer Guide), polishers of different grades.</p>
3	<p>Perform polishing on metals and metal alloys with the help of machines</p> <p>Theory Duration (hh:mm) 12:00</p> <p>Practical Duration (hh:mm) 60:00</p> <p>Corresponding NOS Code CSC/N0113</p>	<ul style="list-style-type: none"> • State safety precautions to be followed while polishing. • Identify potential hazards at the workplace to avoid accidents. • Prepare the work area for polishing. • Choose right polishing machine for different types of material. Kinds of materials: cast iron; zinc/zinc alloys; bronzes; steels (low-carbon, low alloy, high yield, stainless); clad and coated materials; aluminium/aluminium alloys; copper/copper alloys. • Gather required tools and equipment from the concerned authority. 	<p>Training Kit (Presentations, Trainer Guide), vibratory bowl finishing machine, rotating barrel machines, swirling fluidized bed polishing machine, vapour blasting machines, rotary polishing machine, shot blasting machine, surface finish equipment,</p>

Sr. No.	Module	Key Learning Outcomes	Equipment Required
		<ul style="list-style-type: none"> Check for damaged tools or damaged wires. Set the work piece correctly using appropriate work holding devices. Carry out the polishing process as per the standard operating procedure. Mechanical polishing processes: vibro finishing in bowls; barreling of components with abrasive media; fluidized bed polishing; vapour blasting; rotary polishing; shot blasting and grid blasting. Examine the finished product and check for the surface finish requirement. Identify various mechanical polishing process faults. Perform documentation as per the policy. Seek assistance from the supervisor in case of unresolved problems. Undertake numerical computations. Identify basic, compound and solid shapes. Convey and share technical information. Communicate with people in a respectful manner. Plan, prioritize and sequence work operations as per job requirements. Manage own time for achieving better results. Work in a team in order to achieve better results. Demonstrate problem-solving abilities. Identify problems with work planning, procedures, output and behaviour and their implications. 	personal protective equipment (PPE).
4	<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 appropriate PPE for the various tasks performed. Identify job site risks and hazards to avoid accidents at the work place. Hazards: sharp edged and heavy tools; heated metals; gas cylinders; welding radiation; <ul style="list-style-type: none"> hazardous surfaces (sharp, slippery, uneven, chipped, broken, etc.); hazardous substances (chemicals, gas, fumes, dust, etc.); physical hazards (working at heights, large and heavy objects) 	Training kit (Trainer guide, Presentation), leather gloves, leather apron, welding screen – helmet types, hand screen welding and safety shoes.

Sr. No.	Module	Key Learning Outcomes	Equipment Required
		<p>and machines, sharp and piercing objects, tools and machines, intense light, load noise, obstructions in corridors, by doors, blind turns, noise, over stacked shelves and packages, etc.)</p> <ul style="list-style-type: none"> ○ electrical hazards (power supply and points, loose and naked cables and wires, electrical machines and appliances, etc.). <p>Possible causes of risk and accident: physical actions; reading; listening to and giving instructions; inattention; sickness and incapacity (such as drunkenness); health hazards (such as untreated injuries and contagious illness).</p> <ul style="list-style-type: none"> ● Identify the names and locations of people responsible for health and safety in the workplace. ● Identify documents that refer to health and safety in the workplace and where they are located. ● Carry out safe working practices while dealing with hazards to ensure the safety of self and others. <p>Safe working practices: using protective clothing and equipment;</p> <ul style="list-style-type: none"> ○ putting up and reading safety signs; ○ handle tools in the correct manner and store and maintain them properly; ○ keep work area clear of clutter, spillage and unsafe object lying casually; ○ while working with electricity take all electrical precautions like insulated clothing, adequate equipment insulation, use of control equipment, dry work area, switch off the power supply when not required, etc.; ○ safe lifting and carrying practices; ○ use equipment that is working properly and is well maintained; ○ take due measures for safety while working in confined places, trenches or at heights, etc. including safety harness, fall arrestors, etc. <ul style="list-style-type: none"> ● Inspect steps and ladders for faults, set them and use them safely. <p>Ladder faults: corrosion of metal components, deterioration, splits and cracks timber components, imbalance,</p>	

Sr. No.	Module	Key Learning Outcomes	Equipment Required
		<p>loose rungs, missing/ unfixed nuts or bolts, etc. Ladders set up: firm/level base, clip/lash down, leaning at the correct angle, etc.</p> <ul style="list-style-type: none"> • Work safely in and around trenches, elevated places and confined areas. • Lift heavy objects safely using correct procedures. • Apply good housekeeping practices at all times. Good housekeeping practices: clean/tidy work areas, removal/disposal of waste products, protect surfaces. • Identify common hazard signs displayed in various areas. Various areas: on chemical containers; equipment; packages; inside buildings; in open areas and public spaces, etc. 	
5	<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"> • Identify causes of fire accidents. • Recognise required fire extinguisher based on the type of fire. Types of fires: <ul style="list-style-type: none"> ○ Class A: e.g. ordinary solid combustibles, such as wood, paper, cloth, plastic, charcoal, etc.; ○ Class B: flammable liquids and gases, such as gasoline, propane, diesel fuel, tar, cooking oil, and similar substances; ○ Class C: e.g. electrical equipment such as appliances, wiring, breaker panels, etc. (These categories of fires become Class A, B, and D fires when the electrical equipment that initiated the fire is no longer receiving electricity); ○ Class D: combustible metals such as magnesium, titanium, and sodium (These fires burn at extremely high temperatures and require special suppression agents). • Use the various appropriate fire extinguishers on different types of fires correctly. • Interpret fire safety signs. • Inspect evacuation plan in case of fire. • Identify the location of assembly point, fire exit and fire alarm. • Follow reporting procedure in case of a fire. • Participate in fire safety drills at the workplace. 	<p>Training kit (Trainer guide, Presentation), Class A, B, C and D fire extinguishers.</p>

Sr. No.	Module	Key Learning Outcomes	Equipment Required
6	<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"> • Demonstrate good housekeeping in order to prevent fire hazards. • 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. • Administer first aid in case of minor injuries, bleeding, burns, choking, electrical shock, poisoning, etc. • Demonstrate the artificial respiration and CPR process. • Follow correct method to move injured people and others during an emergency. • Explain stages of crisis and crisis management. • Participate in emergency procedures as per role. Emergency procedures: raising alarm, safe/efficient evacuation, correct means of escape, correct assembly point, roll call, correct return to work. • Prepare an accident/incident report or dictate a report to another person and send report to person responsible. Incident Report includes details of: name, date/time of incident, date/time of report, location, environment conditions, persons involved, sequence of events, injuries sustained, damage sustained, actions taken, witnesses, supervisor/manager notified. 	<p>Training kit (Trainer guide, Presentation), First aid kit with all contents.</p>
7	<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"> • State various categories of people that one is required to communicate and co-ordinate within the organization. • Explain the importance of effective communication in the workplace. • Explain the importance of teamwork in organizational and individual success. • Describe various components of effective communication and active listening. • Describe the barriers to effective communication. • Provide and receive information to and from authorized persons accurately and within agreed timescale. • Communicate information to others clearly, at a pace and in a manner that helps them to understand. • Work with colleagues in a positive and 	<p>Training kit (Trainer guide, Presentation)</p>

Sr. No.	Module	Key Learning Outcomes	Equipment Required
		<p>helpful manner, where required and possible.</p> <ul style="list-style-type: none"> Take measures to maximize effectiveness and efficiency in carrying out tasks by consulting with and assisting others. Follow appropriate communication etiquette while working. Communication etiquette: do not use abusive language; use appropriate titles and terms of respect; do not eat or chew while talking (vice versa), use appropriate tone, pitch and language to convey politeness, assertiveness, care and professionalism, etc. Apply active listening skills while interacting with others at work. Explain the importance of ethics and discipline for professional success. Describe common reasons for interpersonal conflict and ways of managing interpersonal conflict effectively. Explain the importance of developing effective working relationships for professional success. Display responsible and disciplined behaviors at the workplace. Disciplined behaviors: e.g. punctuality; completing tasks as per given time and standards; not gossiping and idling time; eliminating waste, honesty, etc. Escalate grievances and problems to appropriate authority as per procedure to resolve them and avoid conflict. 	
	<p>Total Duration</p> <p>Theory Duration 74:00</p> <p>Practical Duration 226:00</p>	<p>Unique Equipment Required: Vibratory Bowl Finishing Machine, Rotating barrel machines, Swirling Fluidized Bed Polishing machine, Vapour Blasting Machines, Rotary polishing machine, shot blasting machine, surface finish equipment, Personal Protective Equipment (PPE), Class A, B, C and D 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: “Polisher-Machine” mapped to Qualification Pack: “CSC/Q0113 v1.0”

Sr. No.	Area	Details
1	Description	The Trainer trains the learners on the occupational standards, using pre-set lesson plans and training materials. They plan for and conduct sessions to impart competency based skills and knowledge. The trainer for ‘machine polisher’ trains the individual to cover the mechanical polishing processes of vibro finishing in bowls, barrelling of components with abrasive media, fluidized bed polishing, vapour blasting, rotary polishing, shot blasting.
2	Personal Attributes	The individual must have expertise in the technical/vocational domain of instruction. They must have strong communication, organisational and interpersonal skills. They must be quality focused and encourage learner engagement. Additionally, they should remain abreast with the latest trends in their domain and upgrade their facilitation skills.
3	Minimum Educational Qualifications	Diploma /Degree in Mechanical Engineering
4a	Domain Certification	Certified for Job Role: “ <u>Polisher-Machine</u> ” mapped to QP: “ <u>CSC/Q0113, v1.0</u> ”. Minimum accepted score is 80%
4b	Platform Certification	Recommended that the Trainer is certified for the Job Role: “ <u>Trainer</u> ”, mapped to the Qualification Pack: “ <u>MEP/Q0102</u> ”. Minimum accepted score as per MEPSC guidelines is 70%.
5	Experience	<ul style="list-style-type: none"> • 3-4 years of industry experience in the relevant field • 1-2 years of teaching experience

Annexure: Assessment Criteria

Criteria For Assessment Of Trainees

Job Role: Polisher-Machine

Qualification Pack: CSC/Q0113

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 center (as per assessment criteria below).
5. Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/training center 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/N0113 Perform polishing on metals and metal alloys with the help of machines	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		4	1	3		
	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 that all measuring equipment are within calibration date and are approved for usage	2	0	2
PC6.ensure work area is clean and safe from hazards before and after the job is completed	2	0	2
PC7.obtain job specification from a valid and approved source	2	0	2
PC8.read and establish job requirements from the job specification document accurately	4	1	3
PC9.report and rectify incorrect and inconsistent information in job specification documents as per organization procedures	4	1	3
PC10.prepare the work area for the polishing operations as per procedure	4	1	3
PC11.obtain correct work-pieces/raw materials and consumables as per job requirements	3	1	2
PC12.identify the metals, metal alloys and non-metals accurately	3	0	3
PC13.interpret surface finish specifications accurately	3	0	3
PC14.select polishing method/technique as per the work requirements	5	2	3
PC15.obtain appropriate tools and equipment per job requirements	3	1	2
PC16.set up machines correctly for carrying out polishing	5	1	4
PC17.set work pieces as per job requirements using appropriate positioning and/or holding devices	5	1	4
PC18.carry out the polishing process in accordance with standard operating procedures	6	2	4
PC19.check parameters for finished/ polished surface to ensure completeness of work	6	2	4
PC20.identify common surface imperfections and correct errors	4	0	4
PC21.complete documentation post completion of work, as per organizational procedure	3	1	2
PC22.keep finished components as well as raw material as per organizational procedure established	4	1	3
PC23.produce components as per standards applicable to the process and in line with production targets	6	2	4
PC24.report conditions and seek appropriate assistance in a timely manner to address risk of failure to comply with necessary targets and specifications	3	0	3
PC25.deal with finished components as per organizational guidelines	3	1	2
PC26.complete documentation during and post operations as per organizational procedures	3	1	2
PC27.return all tools and equipment to the correct location on completion of the fitting	2	0	2

	activities				
	PC28.leave the work area in a safe and tidy condition on completion of job activities		3	1	2
		Total	100	23	77
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 e.g. 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