

# Model Curriculum

## Operator-Conventional Surface Grinding Machines

<b>SECTOR:</b>	<b>CAPITAL GOODS</b>
<b>SUB-SECTOR:</b>	<b>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</b>
<b>OCCUPATION:</b>	<b>Machining</b>
<b>REF ID:</b>	<b>CSC/Q0109, v1.0</b>
<b>NSQF LEVEL:</b>	<b>2</b>



## 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: '**Operator-Conventional Surface Grinding Machines**'  
QP No. '**CSC/Qo109 NSQF Level 2**'

Date of Issuance: Nov 24<sup>th</sup>, 2017

Valid up to : Nov 24<sup>th</sup>, 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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# Operator- Conventional Surface Grinding Machines

## CURRICULUM / SYLLABUS

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

<b>Program Name</b>	<b>Operator-Conventional Surface Grinding Machines</b>		
<b>Qualification Pack Name &amp; Reference ID. ID</b>	CSC/Q0109, v1.0		
<b>Version No.</b>	1.0	<b>Version Update Date</b>	24/11/2017
<b>Pre-requisites to Training</b>	10th Standard passed, preferably		
<b>Training Outcomes</b>	<b>After completing this programme, participants will be able to:</b> <ul style="list-style-type: none"> <li>• Operate grinding machines</li> <li>• Apply basic health and safety practices at the workplace</li> <li>• Work effectively with others</li> </ul>		

This course encompasses 3 out of 3 National Occupational Standards (NOS) of “Operator-Conventional Surface Grinding Machines” Qualification Pack issued by “Capital Goods Skill Council”.

Sr. No.	Module	Key Learning Outcomes	Equipment Required
1	<p><b>Introduction</b></p> <p><b>Theory Duration</b> (hh:mm) 30:00</p> <p><b>Practical Duration</b> (hh:mm) 110:00</p> <p><b>Corresponding NOS Code</b> CSC/N0109</p>	<ul style="list-style-type: none"> <li>State the requirement of grinding in machining operations</li> <li>Identify various types of conventional grinding machines and state their use</li> <li>Explain the importance of keeping the work area clean and tidy</li> <li>Describe various systems of measurement</li> <li>Extract information from the operational drawings</li> <li>Interpret ISO standard symbols and abbreviations</li> <li>Identify various basic, compound and solid shapes</li> <li>Identify various types of materials</li> <li>List various work holding devices and explain their use</li> <li>Describe effects of clamping the work piece using work holding devices</li> <li>Explain the reasons for the distortion of the work piece</li> <li>Explain the necessity of ‘Trueing up’ and dressing of wheels</li> <li>Identify various types of grinding wheels</li> <li>Interpret the specification of grinding wheels</li> <li>List and explain critical parameters for the grinding operation</li> <li>Identify the type of the cutting fluid to be used as per the metal being used in the operation</li> <li>Adhere to the safe working practices while preparing and using the grinding machine</li> <li>Explain the hazards associated with the grinding operation</li> <li>Verify that all tool , equipment, power tool cables are in a safe and usable condition</li> <li>Interpret job specifications from the operation drawing</li> <li>Gather required measuring instruments</li> <li>Check the components for any damages before the operation</li> <li>Prepare the work area for the grinding operation as per standard procedure</li> <li>Mount the work piece safely and securely</li> <li>Set operating parameters</li> <li>Prepare the grinding wheel for the</li> </ul>	<p>Training Kit (PowerPoint, Trainer Guide)</p> <p>Horizontal or vertical surface grinding machines, Cylindrical or universal grinding machines, Magnetic chucks, Angle plates, Vee block, Clamps, Centres, Swivel or universal vice, Fixtures, Mandrels, Overalls, Safety glasses, Safety shoes, External micrometer, Surface finish equipment</p>

Sr. No.	Module	Key Learning Outcomes	Equipment Required
		<p>operation</p> <ul style="list-style-type: none"> <li>Grind components to produce various features</li> <li>Identify the defects caused due to glazed wheels, inappropriate feeds/speeds, damage by work holding devices</li> <li>Check for the quality of the component</li> <li>Shut down the equipment as per the standard procedure</li> <li>Read and interpret information accurately from various job specifications</li> <li>Carryout documentation as per the organizational procedure</li> <li>Perform numerical operations</li> <li>Convey and share technical information correctly</li> <li>Plan, prioritize sequence of operations as per job requirements</li> <li>Manage own time for managing better results</li> <li>Work in a team to achieve desired results</li> <li>Demonstrate problem solving abilities</li> <li>Clarify task-related information with appropriate personnel or technical adviser</li> </ul>	
2	<p><b>Health and safety</b></p> <p><b>Theory Duration</b> (hh:mm) 10:00</p> <p><b>Practical Duration</b> (hh:mm) 08:00</p> <p><b>Corresponding NOS Code</b> CSC/N1335</p>	<ul style="list-style-type: none"> <li>Explain the importance of Personal Protective Equipment (PPE)</li> <li>Identify job site hazards and take corrective actions to avoid such hazards</li> <li>Explain the importance of '5S' at the workplace</li> </ul>	<p>Training kit (Trainer guide, PowerPoint)</p> <p>Leather gloves, leather apron, welding screen – helmet types, hand screen welding and safety shoes</p>
3	<p><b>Fire Safety</b></p> <p><b>Theory Duration</b> (hh:mm) 05:00</p> <p><b>Practical Duration</b> (hh:mm) 30:00</p>	<ul style="list-style-type: none"> <li>Explain types of fires</li> <li>Recognise required fire extinguisher based on the type of fire</li> <li>Apply PASS method to operate a fire extinguisher</li> <li>Follow fire safety signs and safe evacuation method in case of a fire</li> <li>Identify the location of assembly point, fire exit, fire alarm</li> <li>Follow reporting procedure in case of a fire</li> </ul>	<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
	<b>Corresponding NOS Code</b> CSC/N1335		
4	<b>Emergencies, rescue and first aid procedure</b>  <b>Theory Duration</b> (hh:mm) 09:00  <b>Practical Duration</b> (hh:mm) 18:00  <b>Corresponding NOS Code</b> CSC/N1335	<ul style="list-style-type: none"> <li>Follow electrical safety procedures</li> <li>Use approved method to rescue a person from electrocution</li> <li>State the importance of first aid</li> <li>Identify the contents of a first aid kit and their application</li> <li>Administer first aid in case of bleeding, burns, choking, electrical shock, poisoning, etc.</li> <li>Demonstrate CPR process</li> <li>Provide first aid for minor injuries</li> <li>Explain stages of crisis and crisis management</li> <li>Prepare an Incident report as per the guidelines</li> </ul>	Training kit (Trainer guide, PowerPoint)  First aid kit with all contents
5	<b>Work effectively with others</b>  <b>Theory Duration</b> (hh:mm) 20:00  <b>Practical Duration</b> (hh:mm) 60:00  <b>Corresponding NOS Code</b> CSC/N1336	<ul style="list-style-type: none"> <li>Explain the importance of team work and team dynamics</li> <li>State 4Cs of working in a team</li> <li>Explain types of communication</li> <li>Apply effective communication technique</li> <li>Overcome barriers to effective communication</li> <li>Demonstrate active listening skills</li> <li>Demonstrate good customer service skills</li> <li>Explain the importance of ethical behaviour in your day-to-day work</li> <li>State the importance of discipline in life and apply the same at workplace</li> </ul>	Training kit (Trainer guide, PowerPoint)
	<b>Total Duration</b>  <b>Theory Duration</b> <b>74:00</b>  <b>Practical Duration</b> <b>226:00</b>	<b>Unique Equipment Required:</b> Horizontal or vertical surface grinding machines, Cylindrical or universal grinding machines, Magnetic chucks, Angle plates, Vee block, Clamps, Centres, Swivel or universal vice, Fixtures, Mandrels, Overalls, Safety glasses, Safety shoes, External micrometer, Surface finish equipment, 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: “Operator – Conventional Surface Grinding Machines” mapped to Qualification Pack: “CSC/Q0109 v1.0”

Sr. No.	Area	Details
1	<b>Description</b>	It involves carrying out the grinding operations, in accordance with approved procedures, using different grinding machines (eg.horizontal or vertical surface, cylindrical or universal grinding machines).
2	<b>Personal Attributes</b>	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	<b>Minimum Educational Qualifications</b>	Diploma /Degree in Mechanical Engineering
4a	<b>Domain Certification</b>	Certified for Job Role: “ <u>Operator-Conventional Surface Grinding Machines</u> ” mapped to QP: “ <u>CSC/Q0109, v1.0</u> ”. Minimum accepted score is 80%
4b	<b>Platform Certification</b>	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	<b>Experience</b>	<ul style="list-style-type: none"> <li>• 3-4 years of industry experience in the relevant field</li> <li>• 3-4 years of teaching experience</li> </ul>



## Annexure: Assessment Criteria

### Criteria For Assessment Of Trainees

**Job Role:** Operator-Conventional Surface Grinding Machines

**Qualification Pack:** CSC/Q0109

**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/N0109 Operate Grinding Machines	PC1.comply with health and safety, environmental and other relevant regulations and guidelines at work	100	4	1	3	
	PC2.adhere to procedures and guidelines for personal protective equipment (PPE) and other relevant safety regulations while performing fabrication and fitting operations		4	1	3	
	PC3.work following laid down procedures and instructions		4	1	3	
	PC4.ensure work area is clean and safe from hazards		3	0	3	
	PC5.ensure that all tools, equipment, power tool cables, extension leads are in a safe and usable condition		3	0	3	
	PC6.ensure availability of job specification from a valid source		3	1	2	

	PC7.read and establish job requirements from the job specification document (to include symbols and conventions to appropriate ISO standards in relation to work undertaken)		3	1	2
	PC8.check that all measuring equipment are within calibration date		4	0	4
	PC9.obtain and prepare the appropriate materials, tools and equipment		6	2	4
	PC10.ensure that the incoming components used are free from foreign objects, dirt or other contamination		3	0	3
	PC11.prepare and maintain the work area as per procedure or operation specification		4	0	4
	PC12.plan to carry out the required turning activities and the sequence of operations as per specifications		4	1	3
	PC13.mount the work-piece safely and securely, in line with instructions		5	0	5
	PC14.set and adjust the machine tool speeds and feeds, in line with instructions		6	2	4
	PC15.use the machine tool controls safely and correctly, in line with operational procedures		4	1	3
	PC16.prepare grinding wheels through various methods		7	3	4
	PC17.grind components to produce various features as per instructions given		6	2	4
	PC18.report any difficulties or problems that may arise with the grinding activities, and carry out any agreed actions		3	0	3
	PC19.shut down the equipment to a safe condition on completion of the grinding activities		3	0	3
	PC20.check the quality of output, using measuring equipment appropriate to the aspects being checked and the tolerances to be achieved		4	1	3
	PC21.check the machined component for accuracy in dimensions, parallelism and surface texture as per job specifications		4	1	3
	PC22.ensure that the quality control procedures are used while operating the equipment		3	1	2
	PC23.refer the problem to a competent internal specialist if it cannot be resolved		4	0	4
	PC24.obtain help or advice from specialist if the problem is outside his/her area of competence or experience		6	2	4
		<b>Total</b>	<b>100</b>	<b>21</b>	<b>79</b>
CSC/N1335 Use basic	PC1.use protective clothing/equipment for specific tasks and work conditions	100	4	1	3

health and safety practices at the workplace	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
		<b>Total</b>	<b>100</b>	<b>36</b>	<b>64</b>
CSC/N1336 Work effectively with others	PC1.receive information accurately and instructions from the supervisor and fellow workers, getting clarification where required	100	10	3	7
	PC2.pass information accurately 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
		<b>Total</b>	<b>100</b>	<b>30</b>	<b>70</b>