

Model Curriculum

Operator- Boring Machine

SECTOR: CAPITAL GOODS
SUB-SECTOR: 1. Machine Tools
2. Dies, Moulds and Press Tools
3. Plastics Manufacturing Machinery
4. Textile Manufacturing Machinery
5. Process Plant Machinery
6. Electrical and Power Machinery
7. Light Engineering Goods
OCCUPATION: Machining
REF ID: CSC/Q0107, 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: 'Operator - Boring Machine' QP No. 'CSC/Q 0307, NSQF Level 2'

Date of Issuance: April 30th, 2014

Valid up to : August 30th, 2016

Head up to the right corner side of the Qualification Pack is the
valid up to date (no extension/extension is not)



Authorised Signatory
Tourism & Hospitality Skill Council

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Operator-Boring Machine

CURRICULUM / SYLLABUS

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

| | | | |
|---|---|----------------------------|--|
| Program Name | Submerged Arc Welder | | |
| Qualification Pack Name & Reference ID. ID | CSC/Q0107, 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"> • Perform machining operations using horizontal and/or vertical boring machines: performing boring operations in sheet, plate, rolled section or pipe using horizontal and/or vertical boring machines. Preparation for boring activities and select the appropriate horizontal boring tools and cutters, check them for defects, mount and secure them to the relevant tool holding devices and machine spindle to be used. • 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 “Operator-Boring Machine” Qualification Pack issued by “Capital Goods Skill Council”.

| Sr. No. | Module | Key Learning Outcomes | Equipment Required |
|---------|--|---|---|
| 1 | <p>Perform machining operations using horizontal and/or vertical boring machine</p> <p>Theory Duration (hh:mm) 40:00</p> <p>Practical Duration (hh:mm) 100:00</p> <p>Corresponding NOS Code CSC/N0107</p> | <ul style="list-style-type: none"> • Interpret first angle and third angle drawings • Explain different systems of measurement and convert unit from one system of measurement to another • Identify various basic, compound and solid shapes • Define boring operation • Name various types of boring machines and explain their features • Identify various boring tools and work holding devices • Describe the method to calculate cutting parameter and tolerance limits • Choose right procedure and technique to perform horizontal and vertical boring operations • Describe the method set the machine speed for boring operations • Identify hazards associated with boring operations and take necessary actions to avoid such hazards • Follow safety procedures while performing boring operations • Identify and wear Personal Protective Equipment • Interpret job specifications from valid sources • Prepare the work area for boring operations as per the standard procedure • Analyse the sequence of operations and plan operations accordingly • Setup the machine for boring operations as per the recommendation of the manufacturer • Identify various boring tools and cutter <ul style="list-style-type: none"> ○ Boring tool ○ Turning tool ○ Facing tool ○ Recessing tool ○ Twist drill ○ Chamfering tool ○ Reamers ○ Taps • Choose required work holding devices <ul style="list-style-type: none"> ○ Jigs and fixtures ○ Machine Vice ○ Clamps ○ 3-4 jaw chuck ○ Pneumatic/magnetic table | <p>Training kit (Trainer guide, PowerPoint), Horizontal/Vertical boring machine, boring tool, turning tool, facing tool, recessing tool, twist drills, chamfering tool, reamers, taps, jigs and fixtures, machine vice, clamps, 3 jaw chuck, 4 jaw chuck, pneumatic /magnetic table, indexing device, vee block, angle plate, vernier calliper, micrometer, depth gauge, surface finishing measuring equipment, Personal Protective Equipment (PPE)</p> |

| Sr. No. | Module | Key Learning Outcomes | Equipment Required |
|---------|---|---|--|
| | | <ul style="list-style-type: none"> ○ Indexing device ○ Vee block ○ Angle plate ● Mount and secure the component to be bored ● Fix correct cutting tools ● Perform trial run to check for the dimensional accuracy <ul style="list-style-type: none"> ○ External diameter ○ Internal diameter ○ Length/depth ○ Reamed hole size ○ Tapers/angles ○ Thread fit ○ Slot/recess width ○ Surface finish ● Identify any difficulties and report to the concerned authority ● Carry out required documentation as per the company policy ● Demonstrate problem solving abilities ● 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 | |
| 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: Horizontal/Vertical boring machine, boring tool, turning tool, facing tool, recessing tool, twist drills, chamfering tool, reamers, taps, jigs and fixtures, machine vice, clamps, 3 jaw chuck, 4 jaw chuck, pneumatic /magnetic table, indexing device, vee block, angle plate, vernier calliper, micrometer, depth gauge, surface finishing measuring equipment, Personal Protective 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: “Operator-Boring Machine” mapped to Qualification Pack: “CSC/Q0107 v1.0”

| Sr. No. | Area | Details |
|---------|---|--|
| 1 | Description | Performing boring operations in sheet, plate, rolled section or pipe using horizontal and/or vertical boring machines 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: “ <u>Operator- Boring Machine</u> ” mapped to QP: “ <u>CSC/Q0107, 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

| | |
|-----------------------------|------------------------------------|
| Assessment Criteria | |
| Job Role | Operator- Boring Machine |
| Qualification Pack | CSC/Q0107, 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/N0107 Perform machining operations using horizontal and/or vertical boring machine | PC1.comply with health and safety, environmental and other relevant regulations and guidelines at work | 100 | 3 | 1 | 2 |
| | 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.ensure work area is clean and safe from hazards | | 2 | 0 | 2 |
| | PC4.ensure that all tools, equipment, power tool cables, extension leads are in a safe and usable condition | | 2 | 0 | 2 |
| | PC5.ensure that all hand tools and equipment used are in a safe and serviceable condition and are correctly guarded at all times | | 2 | 0 | 2 |
| | PC6.check that all measuring equipment are within calibration date | | 2 | 0 | 2 |
| | PC7.ensure availability of job specification from a valid source | | 2 | 0 | 2 |
| | PC8.read and establish job requirements from the job specification document | | 3 | 0 | 3 |
| | PC9.ensure that the incoming components used are free from foreign objects, dirt or other contamination | | 2 | 0 | 2 |
| | PC10.prepare and maintain the work area as per procedure or operation specification | | 3 | 1 | 2 |
| | PC11.plan to carry out the required boring activities and the sequence of operations as per specifications | | 3 | 1 | 2 |
| | PC12.apply safe working practices and procedures at all times | | 3 | 1 | 2 |
| | PC13.obtain all the appropriate materials, tools and equipment required for the boring operation | | 2 | 0 | 2 |
| | PC14.define cutting parameters | | 2 | 0 | 2 |
| | PC15.measure, mark out the component to be Bored | | 3 | 0 | 3 |
| | PC16.prepare and set up the machine speeds to meet requirements following manufacturers' instructions and company procedures | | 4 | 1 | 3 |
| | PC17.select the appropriate boring tools and cutters and check them for defects | | 3 | 0 | 3 |
| | PC18.mount and secure component to be bored as well as the tools/cutters to the relevant work and tool holding devices and machine spindle, based on the operations to be performed and the size of the component | | 4 | 0 | 4 |
| | PC19.use and maintain hand ancillary equipment | | 2 | 0 | 2 |
| | PC20.operate machinery including parallel line | | 4 | 1 | 3 |

| Assessable Outcome | Assessment Criteria | Total Mark (300) | Out Of | Marks Allocation | |
|---|--|------------------|------------|------------------|------------------|
| | | | | Theory | Skills Practical |
| | and taper boring, facing, turning, drilling and reaming to drawing specifications | | | | |
| | PC21.perform the technique of trial cut for checking dimensional accuracy across various parameters | | 6 | 2 | 4 |
| | PC22.produce component to specification using standard operating procedures | | 5 | 1 | 4 |
| | PC23.monitor the machinery and quality of the finished product following company procedures and manufacturers' instructions | | 5 | 1 | 4 |
| | PC24.achieve given production targets | | 5 | 1 | 4 |
| | PC25.maintain machinery following company procedures and manufacturers' instructions within the limits of candidate's responsibility | | 5 | 1 | 4 |
| | PC26.recognise any difficulties with the process to the required quantity and quality and correct them, report difficulties outside candidate's control to the appropriate person | | 3 | 0 | 3 |
| | PC27.carry out work to the required quality and output to meet agreed production schedules and targets | | 4 | 1 | 3 |
| | PC28.record information on the process in the appropriate information systems | | 3 | 1 | 2 |
| | PC29.refer the problem to a competent specialist if it cannot be resolved | | 3 | 0 | 3 |
| | PC30.obtain help or advice from specialist if the problem is outside candidate's area of competence or experience | | 2 | 0 | 2 |
| | PC31.comply with relevant legislation, standards, policies and procedures | | 4 | 1 | 3 |
| | Total | | 100 | 16 | 84 |
| 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 | | 5 | 2 | 3 |

| Assessable Outcome | Assessment Criteria | Total Mark (300) | Out Of | Marks Allocation | |
|--------------------|---|------------------|--------|------------------|------------------|
| | | | | Theory | Skills Practical |
| | safely use steps and ladders in general use | | | | |
| | PC8.work safely in and around trenches, elevated places and confined areas | | 5 | 2 | 3 |
| | 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 | | 4 | 1 | 3 |

| Assessable Outcome | Assessment Criteria | Total Mark (300) | Out Of | Marks Allocation | |
|---|--|------------------|------------|------------------|------------------|
| | | | | Theory | Skills Practical |
| | report to another person, and send report to person responsible | | | | |
| | PC26.demonstrate correct method to move injured people and others during an emergency | | 4 | 1 | 3 |
| | 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 | 82 | 218 |
| | Percentage Weightage: | | | 27 | 73 |
| | Minimum Pass% to qualify (aggregate): | | | 70 | |