QUALIFICATIONS PACK - OCCUPATIONAL STANDARDS FOR CAPITAL GOODS INDUSTRY

Contents

What are Occupational Standards(OS) ?

- OS describe what individuals need to do, know and understand in order to carry out a particular job role or function
- OS are performance standards that individuals must achieve when carrying out functions in the workplace, together with specifications of the underpinning knowledge and understanding

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Introduction

Qualifications Pack- Operator - Computer Numerically Controlled Electro Discharge Machine (Spark Erosion)

SECTOR/S: CAPITAL GOODS

SUB-SECTOR:

1. Machine Tools
2. Dies, Moulds and Press Tools
3. Plastics Manufacturing Machinery
4. Textile Manufacturing Machinery

OCCUPATION: Machining

REFERENCE ID: CSC/Q0118

ALIGNED TO: NCO-2004/NIL

Brief Job Description: It involves producing machined components that combine a number of different features using a Computer Numerically Controlled (CNC) Electro discharge Machine (EDM), inspecting the components after machining and continuously monitoring the erosion operations.

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.

Job Details

Qualifications Pack Code	**CSC/Q0118**		
Job Role	**Operator - Computer Numerically Controlled Electro Discharge Machine (Spark Erosion)** **(Applicable for National Scenarios)**		
Credits	**TBD**	**Version number**	**1.0**
Sector	**Capital Goods**	**Drafted on**	**10/04/2014**
Sub-sector	**1. Machine Tools** **2. Dies, Moulds and Press Tools** **3. Plastics Manufacturing Machinery** **4. Textile Manufacturing Machinery**	**Last reviewed on**	**24/11/2017**
Occupation	**Machining**	**Next review date**	**24/11/2021**
NSQC Clearance on	**19/05/2015**		

Job Role	Operator - Computer Numerically Controlled Electro Discharge Machine (Spark Erosion)
Role Description	Perform machining operations on metal products using Computer Numerically Controlled Electro-Discharge Machine (spark erosion, wire cut), to modify a range of component shapes, as per given specifications.
NSQF level	3
Minimum Educational Qualifications **Maximum Educational Qualifications**	12th Standard pass, preferably Not Applicable
Prerequisite License or Training	No Previous Training Required
Minimum Job Entry Age	18 Years
Experience	No Previous Experience Required
Applicable National Occupational Standards (NOS)	**Compulsory:** 1. CSC/N0118 Operate a computer numerically controlled electro-discharge machine (spark erosion) to machine metal components 2. CSC/N1335 Use basic health and safety practices at the workplace 3. CSC/N1336 Work effectively with others
Performance Criteria	As described in the relevant OS units

Definitions

Keywords /Terms	Description
Sector	Sector is a conglomeration of different business operations having similar business and interests. It may also be defined as a distinct subset of the economy whose components share similar characteristics and interests.
Sub-sector	Sub-sector is derived from a further breakdown based on the characteristics and interests of its components.
Occupation	Occupation is a set of job roles, which perform similar/ related set of functions in an industry.
Jobrole	Job role defines a unique set of functions that together form a unique employment opportunity in an organisation.
Occupational Standards (OS)	OS specify the standards of performance an individual must achieve when carrying out a function in the workplace, together with the knowledge and understanding they need to meet that standard consistently. Occupational Standards are applicable both in the Indian and global contexts.
Performance Criteria	Performance criteria are statements that together specify the standard of performance required when carrying out a task.
National Occupational Standards (NOS)	NOS are occupational standards which apply uniquely in the Indian context.
Qualifications Pack(QP)	QP comprises the set of OSs, together with the educational, training and other criteria required to perform a job role. A QP is assigned a unique qualifications pack code.
Electives	Electives are NOS/set of NOS that are identified by the sector as contributive to specialization in a job role. There may be multiple electives within a QP for each specialized job role. Trainees must select at least one elective for the successful completion of a QP with Electives.
Options	Options are NOS/set of NOS that are identified by the sector as additional skills. There may be multiple options within a QP. It is not mandatory to select any of the options to complete a QP with Options.
Unit Code	Unit code is a unique identifier for an Occupational Standard, which is denoted by an 'N'
Unit Title	Unit title gives a clear overall statement about what the incumbent should be able to do.
Description	Description gives a short summary of the unit content. This would be helpful to anyone searching on a database to verify that this is the appropriate OS they are looking for.
Scope	Scope is a set of statements specifying the range of variables that an individual may have to deal with in carrying out the function which have a critical impact on quality of performance required.
Knowledge and Understanding	Knowledge and understanding are statements which together specify the technical, generic, professional and organisational specific knowledge that an individual need to perform to the required standard.
Organisational Context	Organisational context includes the way the organisation is structured and how it operates, including the extent of operative knowledge managers have of their relevant areas of responsibility.
Technical Knowledge	Technical knowledge is the specific knowledge needed to accomplish specific designated responsibilities.

Core Skills/Generic Skills	Core skills or generic skills are a group of skills that are the key to learning and working in today's world. These skills are typically needed in any work environment in today's world. In the context of the OS, these include communication related skills that are applicable to most job roles.

Acronyms

Keywords /Terms	Description
CNC	Computer Numerically Controlled
VMC	Vertical Machining Center
EDM	Electro Discharge Machine
CAD	Computer Aided Design
2D	2 Dimensional
3D	3 Dimensional
PPE	Personal Protective Equipment
CO_2	Carbon Dioxide
CPR	Cardiac Pulmonary Resuscitation
ISO	International Organization For Standardization
VDI	Verein Deutscher Ingenieure, The Society Of German Engineers
H Limit	Hard Limit
DTI	Dial Test Indicators
BS/ ISO/ BS EN/ DIN	Quality Management Standards

CSC/N0118 Operate a computer numerically controlled electro-discharge machine (spark erosion) to machine metal components

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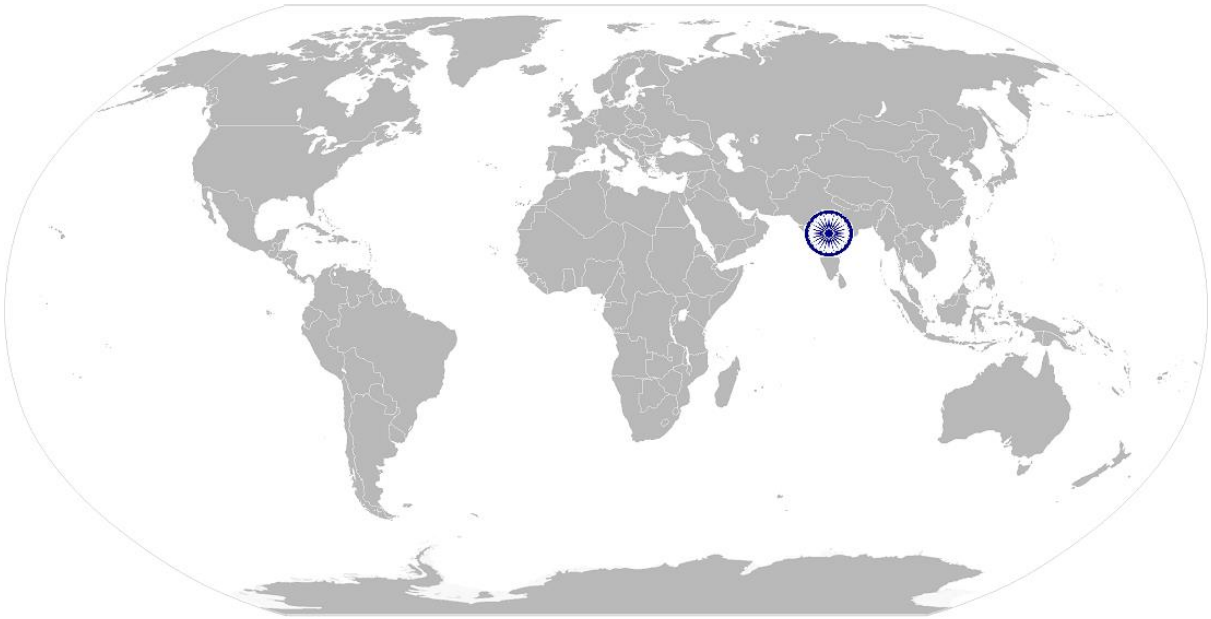
National Occupational Standard



Overview

This unit covers machining of a range of component shapes using computer numerically controlled (CNC) electro-discharge machines (EDM) (spark erosion), as per given specifications.

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National Occupational Standard

Unit Code	CSC/N0118
Unit Title (Task)	Operate a computer numerically controlled electro-discharge machine (spark erosion) to machine metal components
Description	This unit covers machining of a range of component shapes using Computer Numerical Control (CNC) electro-discharge machines (EDM), (spark erosion), as per given specifications. The candidate will be expected to produce a range of components that cover a number of different features.
Scope	This unit/task covers the following: • Work safely • Prepare machine for operations • Carry out machine operations • Test for accuracy • Deal with contingencies

Performance Criteria(PC) w.r.t. the Scope	
Element	**Performance Criteria**
Work safely	To be competent, the user/individual on the job must be able to: PC1. work safely at all times, complying with health and safety and other relevant regulations and guidelines PC2. adhere to procedures or systems in place for health and safety, personal protective equipment (PPE) and other relevant safety regulations PC3. ensure machine guards are in place and correctly adjusted
Prepare machine for operations	To be competent, the user/individual on the job must be able to: PC4. read and establish job requirements from the job specification document Job requirements: raw materials or components required (type, quality, quantity); dimensions; limits and tolerances; surface texture requirements; operations required (list, sequence and procedures where applicable); shape or profiles to be machined; tools to be used; interdependencies; timelines obtain and use the appropriate job specification documentation and specifications from valid source Job specification documents: detailed component drawings; approved sketches/illustrations; national, international and organizational standards; reference tables and charts; operational diagrams PC5. carry out preliminary check and confirm the machine readiness for the machining activities to be carried out Electro discharge machines: CNC Spark Erosion Preliminary check: machine is clean, referencing-zero return, lubrication are

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	functioning, coolant level is correct, sub-systems are working correctly, confirmation received from the machine setter that the machine is ready for production PC6. obtain and use the appropriate job specification documentation and specifications from valid source Valid sources: job instruction sheet/job card; work drawings and instructions; planning documentation; quality control documents; operation sheets; process specifications; instructions from supervisor PC7. use and extract information from reference charts, tables, graphs and standards Information pertaining to: tapping sizes and threads; component ratings; machining symbols and tolerances PC8. seek any necessary instructions/support/information on the operation of the machine, where appropriate PC9. hold components securely without distortion PC10. check that the correct electrode is in place and is in usable condition PC11. ensure that the dielectric fluid is at an appropriate level PC12. check that the operating program is at the correct start point PC13. ensure that the workpiece is clear of the tooling before starting the machine
Carry out machine operations	To be competent, the user/individual on the job must be able to: PC14. follow the defined procedures for starting and running the operating system PC15. ensure that machine settings are adjusted as and when required to maintain the required accuracy PC16. produce component shapes on a range of materials Range of materials: Ferrous: e.g. low, medium and high carbon steels; low alloy steels; stainless steels; cast irons; Non-ferrous: e.g. aluminum and aluminum alloy; bronze; silicon carbide; etc. PC17. produce machined components with the required features Features: faces (square, flat, parallel, angular); threads; forms (concave, convex, square, rectangular); holes (tapered, on pitch circles, rows, angles); engraving; internal and external profile forms; cavities; radii/arcs; parallel or tapered step/slots/shoulders; custom special features PC18. produce components with dimensional accuracy, form and surface texture as per specifications and required standards Dimensional accuracy: parallelism, angle/taper, squareness, surface texture, linear dimensions, flatness, depths, angles, profiles, hole position, hole size/fit PC19. deal promptly and effectively with error messages or equipment faults that are within their control and report those that cannot be solved PC20. monitor the computer process and ensure that the production output is to the

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	required specification PC21. shut down the equipment to a safe condition on conclusion of the activities Activities: correctly isolated; operating programs closed or removed; cleaning the machine; ensuring that any spilt cutting fluids are correctly dealt with; disposing of waste
Test for accuracy	To be competent, the user/individual on the job must be able to: PC22. check that the components produced meet the required specification for quality and accuracy Accuracy standards: components to be free from false starts and sharp edges; dimensional tolerance 20 to 30 microns; surface texture 0.8µm; machined holes within H6; angles within +/- 0.5 degree; flatness and squareness 0.025mm; G and M codes PC23. use appropriate gauges or instruments to carry out the necessary checks, during production, for testing accuracy parameters Accuracy parameters: dimensions, parallelism, angle/taper, squareness, surface texture, profile, position PC24. identify unsatisfactory output and defects PC25. deal with defects and output shortcomings per procedures and appropriate rectification/further processing techniques
Deal with contingencies	To be competent, the user/individual on the job must be able to: PC26. deal promptly and effectively with problems within span of responsibility and control and report those that cannot be solved
Knowledge and Understanding (K)	
A. Organizational Context (Knowledge of the company / organization and its processes)	The user/individual on the job needs to know and understand: KA1. relevant legislation, standards, policies, and procedures followed in the company KA2. key purpose of the organization KA3. department structure and hierarchy protocols KA4. work flow and own role in the workflow KA5. dependencies and interdependencies in the workflow KA6. support functions and types of support available for incumbents in this role
B. Technical Knowledge	The user/individual on the job needs to know and understand: KB1. specific safety precautions to be taken when working with CNC electrical discharge machines and equipment Electro discharge machines: CNC Spark Erosion Safety precautions: adhere to procedures or systems in place for risk assessment, personal protective equipment and other relevant safety regulations and procedures to realize a safe system of work; ensure that machine guards are in place and are correctly adjusted; follow the defined

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	operating procedures and apply safe working practices and procedures at all times; leave the work area and machine in a safe and appropriate condition on completion of the activities; check that electrodes are in a suitable condition; hold components securely without distortion; ensuring long hair is tied back or netted; jewelry or other items that can become entangled in the machinery are removed; points related to electrical hazards & EDM oil
	KB2. safety mechanisms on the machine, and the procedures for checking that they are operating correctly Safety mechanisms: emergency stop buttons, emergency brakes
	KB3. importance of wearing the appropriate protective clothing and equipment
	KB4. importance of keeping the work area clean and tidy
	KB5. hazards associated with the electro-discharge machining operations and how to minimize them and reduce any risks Hazards: revolving/moving parts of machinery; electrical components; airborne and hot metal particles; sharp cutting tools; lifting and handling workholding devices; burrs and sharp edges on component; use of power operated chucks; handling dielectrics; fumes
	KB6. imperial and metric systems of measurement, and measuring equipment used Measuring equipment: rules, micrometers (external, internal, depth), verniers (digital, dial; length, depth; protractors), gauges (slip, bore/hole, thread, plug, radius/profile), dial test indicators (DTI)
	KB7. application of a range of CNC electrical discharge machines
	KB8. where to obtain component drawings, eroding data, specifications and/or job instructions required for the components being machined
	KB9. how to extract and use information from engineering drawings and related specifications (to include symbols and conventions to appropriate BS, ISO or BSEN, DIN standards) in relation to work undertaken Drawings, dimensioning and labeling: projections [orthographic (first angle, third angle), isometric (including exploded), oblique]; reference points, lines, edges and surfaces, continuous dimensions, baseline dimensions
	KB10. how to interpret first and third angle drawings
	KB11. how to interpret the visual display and understand the various messages displayed
	KB12. function of error messages and appropriate, corresponding subsequent action
	KB13. how to start and stop the machine in both normal and emergency situations
	KB14. how to find the correct restart point in the program when the machine has been stopped before completion of the program
	KB15. workpiece reference points and system of tolerances

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	KB16. operation of various hand and automatic modes of machine control Mode of machine control: program operating and control buttons; keyboards and touchpads KB17. how to operate the machine, using single block run, full program run and feed/speed override controls KB18. importance of accounting for electrode wear and how to make adjustments to the program operating parameters to take account of it KB19. importance of spark gap KB20. sparking and arcing in EDM machining and the course of action if it takes place KB21. importance of flushing and flow of EDM oil KB22. importance of +/- polarity KB23. how to set and secure the workpiece to the machine table/workholding device correctly Positioning and holding devices: clamping direct to machine table; pneumatic or magnetic table; machine vice (eg. plain, swivel, universal); angle plate; vee block and clamps; fixtures; ancillary indexing device KB24. the effects of clamping the workpiece and how material removal can cause warping/distortion of the finished workpiece KB25. various types of materials used for electrodes Materials: copper, tungsten copper, graphite KB26. various types of electrodes used KB27. how electrodes are located and secured to the machine head, tool cartridge and tool magazine KB28. safe and correct handling and storage of tooling KB29. importance of the electrode condition, and the effects that worn tooling will have on the workpiece surface finish and tolerances KB30. how to check electrode condition is appropriate for use KB31. importance and procedures for dressing and reshaping electrodes, and the equipment to be used KB32. problems that can occur with electrical discharge activities, and how these can be overcome KB33. application of dielectric and ionized fluids with regard to different materials being machined KB34. correct handling and storage procedures for dielectric and ionized fluids KB35. quality control procedures used, inspection checks to be carried out, and the equipment that is used
Skills (S)	
	Reading Skills

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A. Core Skills/ GenericSkills	The user/ individual on the job needs to know and understand how to: SA1. read and interpret information correctly from various job specification documents, health and safety instructions, memos, etc. applicable to the job in English and/or local language
	Writing Skills
	The user/individual on the job needs to know and understand how to: SA2. fill up appropriate technical forms, process charts, activity logs as per organizational format in English and/or local language SA3. undertake basic numerical computations and calculations Numerical computations: addition, subtraction, multiplication, division, fractions and decimals, percentages and proportions, simple ratios and averages SA4. identify various basic, compound and solid shapes as per dimensions given Basic shapes: square, rectangle, triangle, circle, quadrilaterals Compound shapes: involving squares, rectangles, triangles, circles, semi-circles, quadrants of a circle Solid shapes: cube, rectangular prism, cylinder SA5. use appropriate measuring techniques and units of measurement SA6. use appropriate units and number systems to express degree of accuracy Units and number systems representing degree of accuracy: decimals places, significant figures, fractions as a decimal quantity SA7. use metric systems of measurement
	Oral Communication (Listening and Speaking skills)
	The user/individual on the job needs to know and understand how to: SA8. convey and share technical information clearly using appropriate language SA9. check and clarify task-related information SA10. liaise with appropriate authorities using correct protocol SA11. communicate with people in respectful form and manner in line with organizational protocol
B. Professional Skills	**Decision Making**
	NA
	Plan and Organize
	The user/individual on the job needs to know and understand how to: SB1. plan, prioritize and sequence work operations as per job requirements SB2. organize and analyze information relevant to work SB3. basic concepts of shop-floor work productivity including waste reduction, efficient material usage and optimization of time

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	Customer Centricity
	The user/individual on the job needs to know and understand how to: SB4. exercise restraint while expressing dissent and during conflict situations SB5. avoid and manage distractions to be disciplined at work SB6. manage own time for achieving better results SB7. work in a team in order to achieve better results SB8. identify and clarify work roles within a team SB9. communicate and cooperate with others in the team for better results SB10. seek assistance from fellow team members
	Problem Solving
	The user/individual on the job needs to know and understand how to: SB11. identify problems with work planning, procedures, output and behavior and their implications SB12. prioritize and plan for problem solving SB13. communicate problems appropriately to others SB14. identify sources of information and support for problem solving SB15. seek assistance and support from other sources to solve problems SB16. identify effective resolution techniques SB17. select and apply resolution techniques SB18. seek evidence for problem resolution
	Analytical Thinking
	The user/individual on the job needs to know and understand how to: SB19. undertake and express new ideas and initiatives to others SB20. modify work plan to overcome unforeseen difficulties or developments that occur as work progresses SB21. participate in improvement procedures including process, quality and internal/external customer/supplier relationships SB22. enhance one's competencies in new and different situations and contexts to achieve more
	Critical Thinking
	The user/individual on the job needs to know and understand how to: SB23. participate in on-the-job and other learning, training and development interventions and assessments SB24. clarify task related information with appropriate personnel or technical adviser SB25. seek to improve and modify own work practices SB26. maintain current knowledge of application standards, legislation, codes of practice and product/process developments

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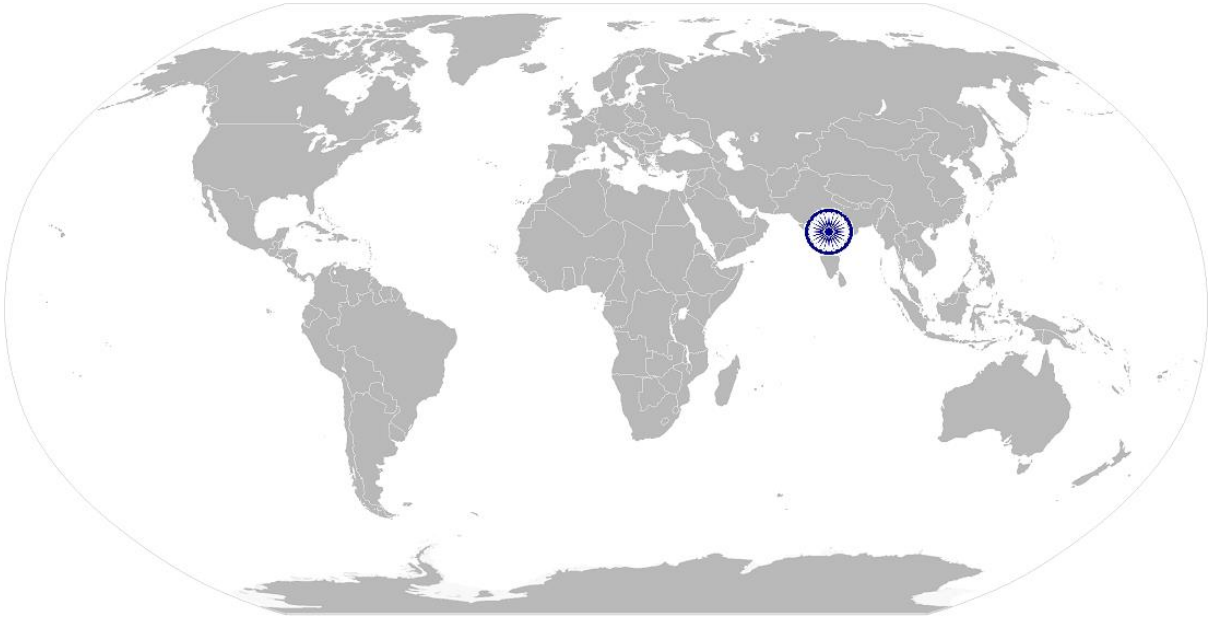
NOS Version Control

NOS Code	CSC/N0118		
Credits	TBD	Version number	1.0
Industry	Capital Goods	Drafted on	10/04/2014
Industry Sub-sector	1. Machine Tools 2. Dies, Moulds and Press Tools 3. Plastics Manufacturing Machinery 4. Textile Manufacturing Machinery	Last reviewed on	24/11/2017
Occupation	Machining	Next review date	24/11/2021

CSC/N1335 Use basic health and safety practices at the workplace

National Occupational Standard



Overview

This unit covers health, safety and security at the workplace. This includes procedures and practices that candidates need to follow to help maintain a healthy, safe and secure work environment.

CSC/N1335 Use basic health and safety practices at the workplace

National Occupational Standard

Unit Code	**CSC/N1335**
Unit Title (Task)	**Use basic health and safety practices at the workplace**
Description	This OS unit is about knowledge and practices relating to health, safety and security that candidates need to use in the workplace. It covers responsibilities towards self, others, assets and the environment.
Scope	This unit/task covers the following: • Health and safety • Fire safety • Emergencies, rescue and first-aid procedure

Performance Criteria(PC) w.r.t. the Scope	
Element	**Performance Criteria**
Health and safety	To be competent, the user/individual on the job must be able to: PC1. use protective clothing/equipment for specific tasks and work conditions Protective clothing: leather or asbestos gloves, flame proof aprons, flame proof overalls buttoned to neck, cuffless (without folds), trousers, reinforced footwear, helmets/hard hats, cap and shoulder covers, ear defenders/plugs, safety boots, knee pads, particle masks, glasses/goggles/visors Equipment: hand shields, machine guards, residual current devices, shields, dust sheets, respirator PC2. state the name and location of people responsible for health and safety in the workplace PC3. state the names and location of documents that refer to health and safety in the workplace PC4. identify job-site hazardous work and state possible causes of risk or accident in the workplace Hazards: sharp edged and heavy tools; heated metals; oxyfuel and gas cylinders; welding radiation; hazardous surfaces(sharp, slippery, uneven, chipped, broken, etc.); hazardous substances(chemicals, gas, oxy-fuel, fumes, dust, etc.); physical hazards(working at heights, large and heavy objects and machines, sharp and piercing objects, tolls and machines, intense light, load noise, obstructions in corridors, by doors, blind turns, noise, over stacked shelves and packages, etc.) electrical hazards (power supply and points, loose and naked cables and wires, electrical machines and appliances, etc.) 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

CSC/N1335 Use basic health and safety practices at the workplace

	illness) PC5. carry out safe working practices while dealing with hazards to ensure the safety of self and others Safe working practices: using protective clothing and equipment; 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. PC6. state methods of accident prevention in the work environment of the job role Methods of accident prevention: training in health and safety procedures; using health and safety procedures; use of equipment and working practices (such as safe carrying procedures); safety notices, advice; instruction from colleagues and supervisors PC7. state location of general health and safety equipment in the workplace General health and safety equipment: fire extinguishers; first aid equipment; safety instruments and clothing; safety installations(eg fire exits, exhaust fans) PC8. inspect for faults, set up and safely use steps and ladders in general use Ladder faults: corrosion of metal components, deterioration, splits and cracks timber components, imbalance, loose rungs, missing/ unfixed nuts or bolts, etc. Ladders set up: firm/level base, clip/lash down, leaning at the correct angle, etc. PC9. work safely in and around trenches, elevated places and confined areas PC10. lift heavy objects safely using correct procedures PC11. apply good housekeeping practices at all times Good housekeeping practices: clean/tidy work areas, removal/disposal of waste products, protect surfaces PC12. identify common hazard signs displayed in various areas Various areas: on chemical containers; equipment; packages; inside buildings; in open areas and public spaces, etc. PC13. retrieve and/or point out documents that refer to health and safety in the workplace Documents: fire notices, accident reports, safety instructions for equipment and procedures, company notices and documents, legal documents (eg

CSC/N1335 Use basic health and safety practices at the workplace

	government notices)
Fire safety	To be competent, the user/individual on the job must be able to: PC14. use the various appropriate fire extinguishers on different types of fires correctly Types of fires: Class A: eg. 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: eg. 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) PC15. demonstrate rescue techniques applied during fire hazard PC16. demonstrate good housekeeping in order to prevent fire hazards PC17. demonstrate the correct use of a fire extinguisher
Emergencies, rescue and first-aid procedures	To be competent, the user/individual on the job must be able to: PC18. demonstrate how to free a person from electrocution PC19. administer appropriate first aid to victims where required eg. in case of bleeding, burns, choking, electric shock, poisoning etc. PC20. demonstrate basic techniques of bandaging PC21. respond promptly and appropriately to an accident situation or medical emergency in real or simulated environments PC22. perform and organize loss minimization or rescue activity during an accident in real or simulated environments 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 PC24. demonstrate the artificial respiration and the CPR Process PC25. participate in emergency procedures Emergency procedures: raising alarm, safe/efficient, evacuation, correct means of escape, correct assembly point, roll call, correct return to work PC26. complete a written 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 PC27. demonstrate correct method to move injured people and others during an emergency

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Knowledge and Understanding (K)	
A. Organizational Context (Knowledge of the company / organization and its processes)	The user/individual on the job needs to know and understand: KA1. names (and job titles if applicable), and where to find, all the people responsible for health and safety in a workplace KA2. names and location of documents that refer to health and safety in the workplace
B. Technical Knowledge	The user/individual on the job needs to know and understand: KB1. meaning of "hazards" and "risks" KB2. health and safety hazards commonly present in the work environment and related precautions KB3. possible causes of risk, hazard or accident in the workplace and why risk and/or accidents are possible KB4. possible causes of risk and accident 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) KB5. methods of accident prevention Methods of accident prevention: training in health and safety procedures; using health and safety procedures; use of equipment and working practices (such as safe carrying procedures); safety notices, advice; instruction from colleagues and supervisors KB6. safe working practices when working with tools and machines KB7. safe working practices while working at various hazardous sites KB8. where to find all the general health and safety equipment in the workplace KB9. various dangers associated with the use of electrical equipment KB10. preventative and remedial actions to be taken in the case of exposure to toxic materials Exposure: ingested, contact with skin, inhaled Preventative action: ventilation, masks, protective clothing/ equipment); Remedial action: immediate first aid, report to supervisor Toxic materials: solvents, flux, lead KB11. importance of using protective clothing/equipment while working KB12. precautionary activities to prevent the fire accident KB13. various causes of fire Causes of fires: heating of metal; spontaneous ignition; sparking; electrical heating; loose fires (smoking, welding, etc.); chemical fires; etc. KB14. techniques of using the different fire extinguishers KB15. different methods of extinguishing fire

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	KB16. different materials used for extinguishing fire Materials: sand, water, foam, CO_2, dry powder KB17. rescue techniques applied during a fire hazard KB18. various types of safety signs and what they mean KB19. appropriate basic first aid treatment relevant to the condition eg. shock, electrical shock, bleeding, breaks to bones, minor burns, resuscitation, poisoning, eye injuries KB20. content of written accident report KB21. potential injuries and ill health associated with incorrect manual handing KB22. safe lifting and carrying practices KB23. personal safety, health and dignity issues relating to the movement of a person by others KB24. potential impact to a person who is moved incorrectly
Skills (S)	
A. Core Skills/ Generic Skills	**Reading Skills**
	The user/ individual on the job needs to know and understand how to: SA1. read and comprehend basic content to read labels, charts, signages SA2. read and comprehend basic English to read manuals of operations SA3. read an accident/incident report in local language or English
	Writing Skills
	The user/individual on the job needs to know and understand how to: SA4. write an accident/incident report in local language or English
	Oral Communication (Listening and Speaking skills)
	The user/individual on the job needs to know and understand how to: SA5. question coworkers appropriately in order to clarify instructions and other issues SA6. give clear instructions to coworkers, subordinates others
B. Professional Skills	**Decision Making**
	The user/individual on the job needs to know and understand how to: SB1. make appropriate decisions pertaining to the concerned area of work with respect to intended work objective, span of authority, responsibility, laid down procedure and guidelines
	Plan and Organize
	The user/individual on the job needs to know and understand how to: SB2. plan and organize their own work schedule, work area, tools, equipment and materials to maintain decorum and for improved productivity
	Customer Centricity
	The user/individual on the job needs to know and understand how to:

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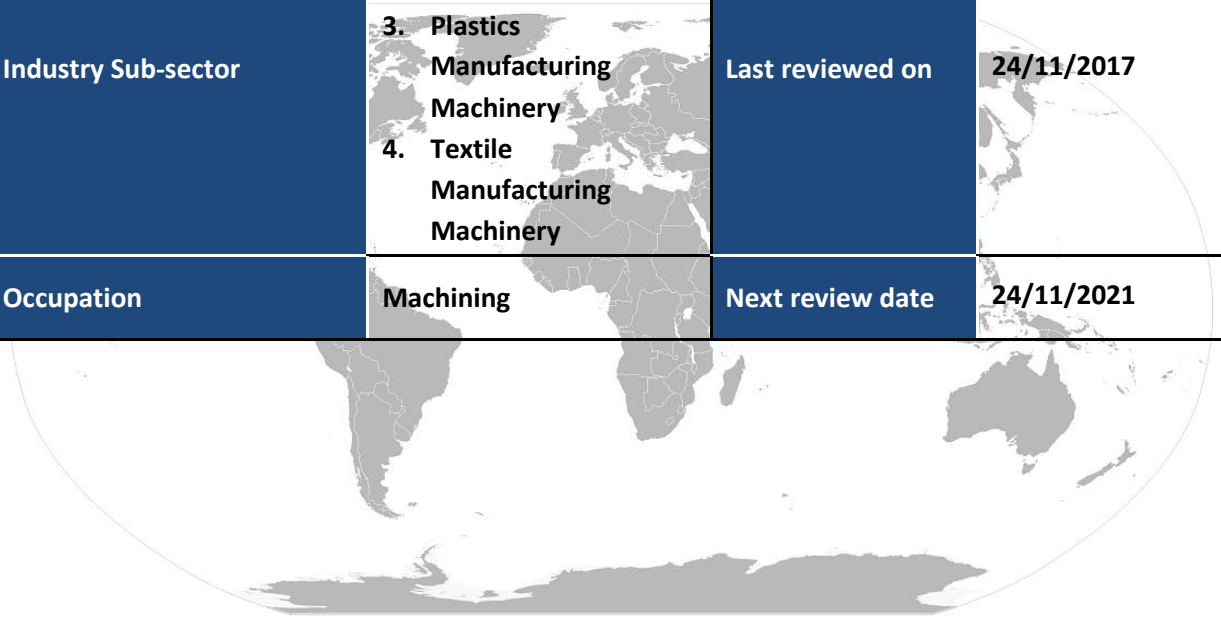
	SB3. remain congenial while discussing and debating issues with co-workers SB4. follow appropriate protocols for communication based on situation, hierarchy, organizational culture and practice SB5. ask for, provide and receive required assistance where possible to ensure achievement of work related objectives SB6. thank coworkers for any assistance received SB7. offer appropriate respect based on mutuality and respect for fellow workmanship and authority
	Problem Solving
	The user/individual on the job needs to know and understand how to: SB8. think through the problem, evaluate the possible solution(s) and suggest an optimum /best possible solution(s) SB9. identify immediate or temporary solutions to resolve delays SB10. identify sources of support that can be availed of for problem solving for various kind of problems SB11. seek appropriate assistance from other sources to resolve problems SB12. report problems that you cannot resolve to appropriate authority
	Analytical Thinking
	The user/individual on the job needs to know and understand how to: SB13. identify cause and effect relations in their area of work SB14. use cause and effect relations to anticipate potential problems and their solution
	Critical Thinking
	NA

CSC/N1335 Use basic health and safety practices at the workplace

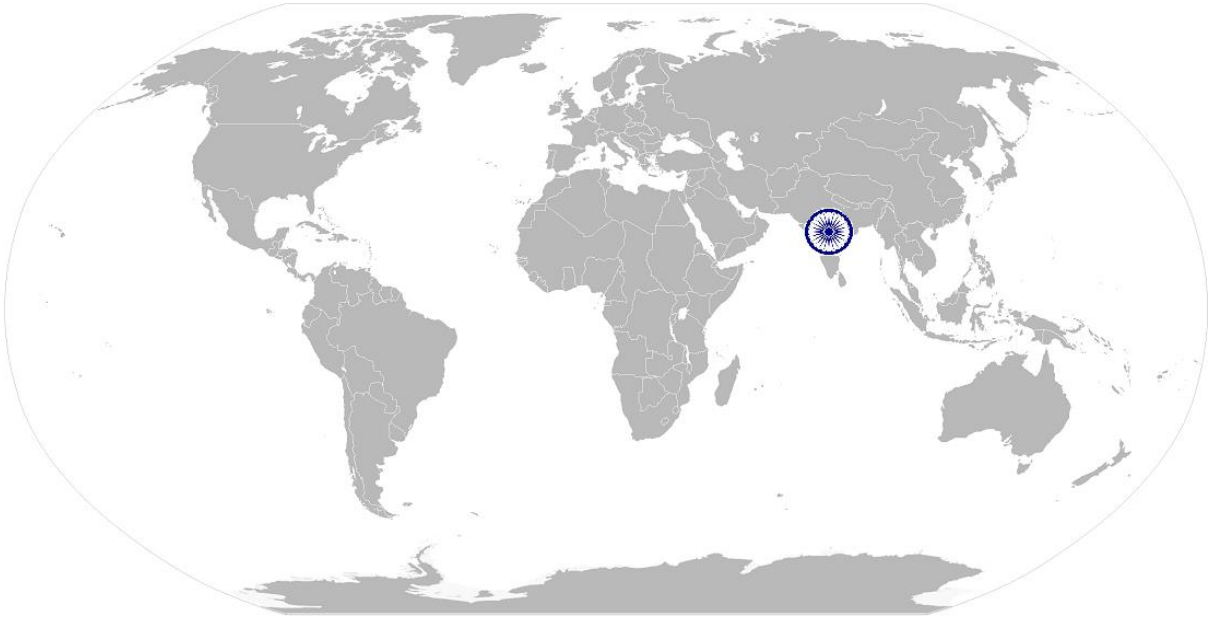
NOS Version Control

NOS Code	CSC/N1335		
Credits	TBD	Version number	1.0
Industry	Capital Goods	Drafted on	10/04/2014
Industry Sub-sector	1. Machine Tools 2. Dies, Moulds and Press Tools 3. Plastics Manufacturing Machinery 4. Textile Manufacturing Machinery	Last reviewed on	24/11/2017
Occupation	Machining	Next review date	24/11/2021



CSC/N1336 **Work effectively with others**

National Occupational Standard



Overview

This unit covers basic practices that improve effectiveness of working with others in an organizational set-up.

CSC/N1336 **Work effectively with others**

National Occupational Standard

Unit Code	**CSC/N1336**
Unit Title (Task)	**Work effectively with others**
Description	This unit covers basic etiquette and competencies that a candidate is required to possess and demonstrate in their behavior and interactions with others at the workplace. These cover areas such as communication etiquette, discipline, listening etc.
Scope	This unit/task covers the following: • Work effectively with others
Performance Criteria(PC) w.r.t. the Scope	
Element	**Performance Criteria**
Work effectively with others	To be competent, the user/individual on the job must be able to: PC1. receive information accurately and instructions from the supervisor and fellow workers, getting clarification where required PC2. pass information accurately to authorized persons who require it and within agreed timescale and confirm its receipt PC3. give information to others clearly, at a pace and in a manner that helps them to understand PC4. display helpful behavior by assisting others in performing tasks in a positive manner, where required and possible PC5. consult with and assist others to maximize effectiveness and efficiency in carrying out tasks PC6. display 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)etc. PC7. display active listening skills while interacting with others at work PC8. use appropriate tone, pitch and language to convey politeness, assertiveness, care and professionalism PC9. demonstrate 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. PC10. escalate grievances and problems to appropriate authority as per procedure to resolve them and avoid conflict
Knowledge and Understanding (K)	
A. Organizational Context (Knowledge of the company /	The user/individual on the job needs to know and understand: KA1. legislation, standards, policies, and procedures followed in the company relevant to own employment and performance conditions KA2. reporting structure, inter-dependent functions, lines and procedures in the

CSC/N1336 **Work effectively with others**

organization and its processes)	work area KA3. relevant people and their responsibilities within the work area KA4. escalation matrix and procedures for reporting work and employment related issues
B. Technical Knowledge	The user/individual on the job needs to know and understand: KB1. various categories of people that one is required to communicate and co-ordinate with in the organization KB2. importance of effective communication in the workplace KB3. importance of teamwork in organizational and individual success KB4. various components of effective communication KB5. key elements of active listening KB6. value and importance of active listening and assertive communication KB7. barriers to effective communication KB8. importance of tone and pitch in effective communication KB9. importance of avoiding casual expletives and unpleasant terms while communicating professional circles KB10. how poor communication practices can disturb people, environment and cause problems for the employee, the employer and the customer KB11. importance of ethics for professional success KB12. importance of discipline for professional success KB13. what constitutes disciplined behavior for a working professional KB14. common reasons for interpersonal conflict KB15. importance of developing effective working relationships for professional success KB16. expressing and addressing grievances appropriately and effectively KB17. importance and ways of managing interpersonal conflict effectively
Skills (S)	
A. Core Skills/ Generic Skills	**Reading Skills**
	The user/ individual on the job needs to know and understand how to: SA1. read basic terms and terminologies to accurately interpret work related documents, labels, supervisor instructions in the local language SA2. read and interpret accurate information from various relevant work instructions and records
	Writing Skills
	The user/ individual on the job needs to know and understand how to: SA3. write clear and legible notes to self, colleagues and seniors to pass messages, keep records, prepare to-do lists, take down instructions SA4. write basic numbers, quantities and work related terminology for operational requirements in the local language

CSC/N1336 **Work effectively with others**

	Oral Communication (Listening and Speaking skills)
	The user/individual on the job needs to know and understand how to: SA5. interact with the supervisor appropriately (correct protocol and manner of speaking) in order to understand the basic requirements of the product, production plans and other associated requirements SA6. give clear instructions to co-workers about the type of output required and answer queries SA7. display active listening skills while interacting with co-workers and other in the workplace
B. Professional Skills	**Decision Making**
	NA
	Plan and Organize
	The user/individual on the job needs to know and understand how to: SB1. use appropriate planning to maintain a smooth relationship with fellow team members SB2. take steps within one's limits of authority to initiate modification in plan if the circumstances require it
	Customer Centricity
	The user/individual on the job needs to know and understand how to: SB3. check that work meets customer requirements SB4. deliver consistent and reliable service to internal and external customers
	Problem Solving
	The user/individual on the job needs to know and understand how to: SB5. work with co-workers and supervisor to resolve any issues that threaten disruption, increase risk, cause delays or under-achievement of quality and targets as per the planned schedule
	Analytical Thinking
	NA
	Critical Thinking
	NA

CSC/N1336 **Work effectively with others**

NOS Version Control

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Credits	TBD	Version number	1.0
Industry	Capital Goods	Drafted on	10/04/2014
Industry Sub-sector	1. Machine Tools 2. Dies, Moulds and Press Tools 3. Plastics Manufacturing Machinery 4. Textile Manufacturing Machinery	Last reviewed on	24/11/2017
Occupation	Machining	Next review date	24/11/2021

Annexure

Nomenclature for QP and NOS

Qualifications Pack

9 characters

[ABC]/ Q 0101

[Insert 3 letter codes for SSC]

Q denoting Qualifications Pack

QP number (2 numbers)

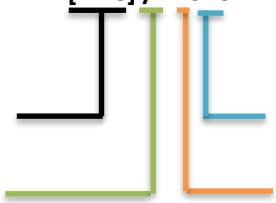
Occupation (2 numbers)

Occupational Standard

An example of NOS with 'N'

9 characters

[ABC] / N 0101



[Insert 3 letter codes for SSC]

N denoting National Occupational Standard

OS number (2 numbers)

Occupation (2 numbers)

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The following acronyms/ codes have been used in the nomenclature above:

Sub-sector	Range of Occupation numbers
Machine Tools	01-13
Dies, Moulds and Press Tools	01-13
Plastic Manufacturing Machinery	01-13
Textile Manufacturing Machinery	01-13
Process Plant Machinery	01-13
Electrical and Power Machinery	01-13
Light Engineering Goods	01-13

Sequence	Description	Example
Three letters	Capital Goods	CSC
Slash	/	/
Next letter	Whether **Q**P or **N**OS	N
Next two numbers	Occupation code	01
Next two numbers	OS number	01

Criteria For Assessment Of Trainees

Job Role: Operator - Computer Numerically Controlled Electro Discharge Machine (Spark Erosion)

Qualification Pack: CSC/Q0118

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.

Compulsory NOS **Total Marks: 300**				**Marks Allocation**	
Assessment outcomes	**Assessment Criteria for outcomes**	**Total Marks**	**Out of**	**Theory**	**Skills Practical**
CSC/N0118 Operate a computer numerically controlled electro-discharge machine(spark erosion) to machine metal components	PC1.work safely at all times, complying with health and safety and other relevant regulations and guidelines	100	4	1	3
	PC2.adhere to procedures or systems in place for health and safety, personal protective equipment (PPE) and other relevant safety regulations		5	1	4
	PC3.ensure machine guards are in place and correctly adjusted		3	0	3
	PC4.read and establish job requirements from the job specification document		3	0	3
	PC5.carry out preliminary check and confirm the machine readiness for the machining activities to be carried out		4	0	4

	PC6.obtain and use the appropriate job specification documentation and specifications from valid source		3	0	3
	PC7.use and extract information from reference charts, tables, graphs and standards		3	0	3
	PC8.seek any necessary instructions/ support/ information on the operation of the machine, where appropriate		3	0	3
	PC9.hold components securely without distortion		3	0	3
	PC10.check that the correct electrode is in place and is in usable condition		4	0	4
	PC11.ensure that the dielectric fluid is at an appropriate level		3	0	3
	PC12.check that the operating program is at the correct start point		3	0	3
	PC13.ensure that the workpiece is clear of the tooling before starting the machine		3	0	3
	PC14.follow the defined procedures for starting and running the operating system		4	1	3
	PC15.ensure that machine settings are adjusted as and when required to maintain the required accuracy		3	0	3
	PC16.produce component shapes on a range of materials		5	0	5
	PC17.produce machined components with the required features		5	0	5
	PC18. produce components with dimensional accuracy, form and surface texture as per specifications and required standards		6	2	4
	PC19.deal promptly and effectively with error messages or equipment faults that are within their control and report those that cannot be solved		4	0	4
	PC20.monitor the computer process and ensure that the production output is to the required specification		4	1	3
	PC21.shut down the equipment to a safe condition on conclusion of the activities		3	0	3
	PC22.check that the components produced meet the required specification for quality and accuracy		5	2	3
	PC23.use appropriate gauges or instruments to carry out the necessary checks, during production, for testing accuracy parameters		5	2	3
	PC24.identify unsatisfactory output and defects		3	0	3
	PC25.deal with defects and output shortcomings per procedures and appropriate rectification/further processing techniques		6	2	4

	PC26.deal promptly and effectively with problems within span of responsibility and control and report those that cannot be solved		3	0	3
		Total	**100**	**12**	**88**
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.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
		Total	**100**	**30**	**70**