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- Fitter- Mechanical Assembly

SECTOR/S: 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: Fitting and Assembly

REFERENCE ID: CSC/Q0304

ALIGNED TO: NCO-2004/8281.10

Brief Job Description: It involves marking out the material for the features to be produced, and then use hand tools, portable power tools, manually operated machine tools and shaping, fitting and assembly techniques appropriate to the operations being performed. The candidate will be expected to check the quality of the workpiece, using measuring equipment.

Personal Attributes: Basic communication, numerical and computational abilities. Openness to learning, ability to plan and organise own work and identify and solve problems in the course of working. Understanding the need to take initiative and manage self and one's work to improve efficiency and effectiveness.

Job Details

Qualifications Pack Code	**CSC/Q0304**		
Job Role	**Fitter- Mechanical Assembly** **[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** **5. Process Plant Machinery** **6. Electrical and Power Machinery** **7. Light Engineering Goods**	**Last reviewed on**	**24/11/2017**
Occupation	**Fitting and Assembly**	**Next review date**	**24/11/2021**
NSQC Clearance on	**22/04/2015**		

Job Role	Fitter - Mechanical Assembly
Role Description	Perform basic machining, fitting and assembly activities of machinery to produce machinery of features as per given specifications.
NSQF level	3
Minimum Educational Qualifications **Maximum Educational Qualifications**	10th Standard pass, preferably Not Applicable
Prerequisite License or Training	No Previous Training Required
Minimum Job Entry Age	18 Years
Experience	Minimum 1 year as a Fitter Fabricator or Machinist
Applicable National Occupational Standards (NOS)	**Compulsory:** 1. CSC/N0304 Perform fitting and assembly operations on 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.
Job role	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

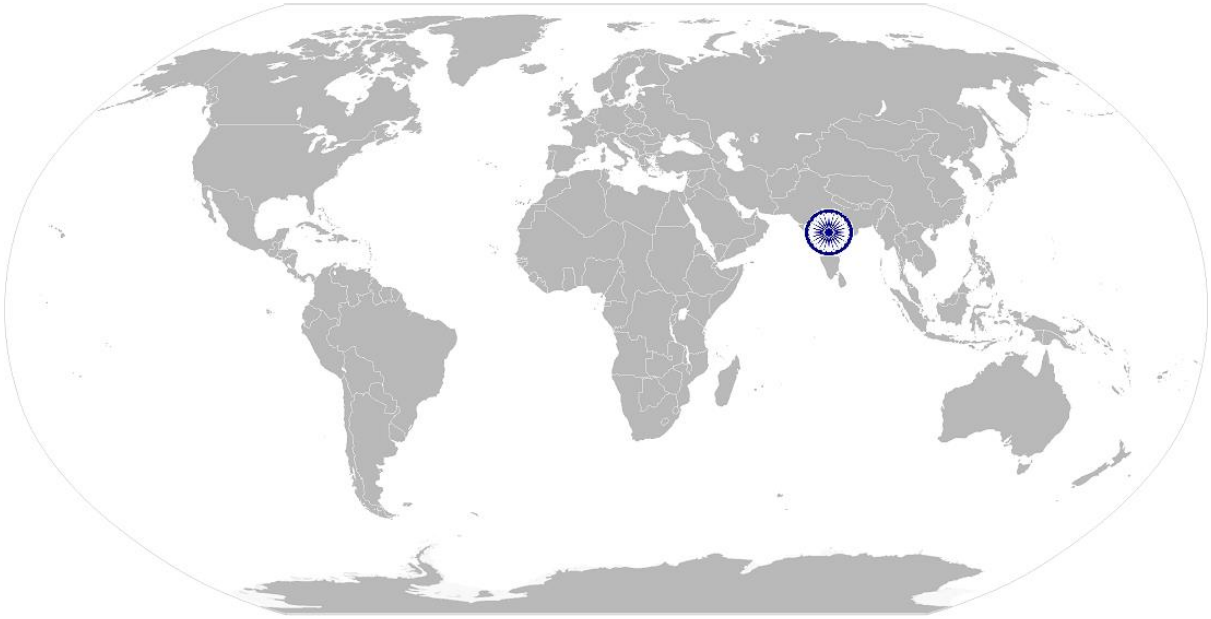
	specific designated responsibilities.
Core Skills/Generic Skills	Core skills or generic skills are a group of skills that are the key to learning and working in today's world. These skills are typically needed in any work environment in today's world. In the context of the OS, these include communication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

Acronyms

Keywords /Terms	Description
GD&T	Geometric Dimensioning And Tolerancing
DTI	Dial Test Indicators
CMM	Coordinate Masuring Machine
ECM	Electrochemical Machining
BODMAS	Brackets/ Of/ Division/ Multiplication/ Addition/ Subtraction
CO_2	Carbon Dioxide
CPR	Cardiac Pulmonary Resuscitation
PPE	Personal Protective Equipment

CSC/N0304 Perform fitting and assembly operations on metal components

National Occupational Standard



Overview

This unit covers the basic fitting and assembly activities of machinery to produce machinery of features as per given specifications.

CSC/N0304 Perform fitting and assembly operations on metal components

National Occupational Standard

Unit Code	CSC/N0304
Unit Title (Task)	**Perform fitting and assembly operations on metal components**
Description	This unit covers the basic fitting and assembly activities to produce machinery of features as per given specifications. The candidate will be able to carry out fitting and assembly activities with understanding of the required equipment, manufacturing techniques and the operating and safety procedures.
Scope	This unit/task covers the following: • Work safely • Prepare for general machining, fitting or assembling operations • Mark out the components • Perform general fitting operations • Perform assembling operations • Measure and checking component

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. comply with health and safety, environmental and other relevant regulations and guidelines at work PC2. adhere to procedures and guidelines for personal protective equipment (PPE) and other relevant safety regulations while performing fitting operations PC3. ensure work area is clean and safe from hazards Hazards: use of power tools, trailing leads or hoses, damaged or badly maintained tools and equipment; using files with damaged or poor fitting handles; using machine tools; handling of oils and grease; misuses of tools; not following laid-down maintenance procedures PC4. ensure that all tools, equipment, power tool cables, extension leads are in a safe and usable condition PC5. ensure that all machines and machine tools are secured at all times
Prepare for general machining, fitting or assembling operations	To be competent, the user/individual on the job must be able to: PC6. determine job requirement from job specification documents obtained from valid sources 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 fabricated; cutting, bending and rolling allowances for

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	fabricated forms; instruments and tools to be used; interdependencies; timelines Job specification documents: detailed component drawings; approved sketches/illustrations; national, international and organisational standards; reference tables and charts; fabrication/casting drawings Valid source: job instruction sheet/job card; work drawings and instructions; planning documentation; quality control documents; operation sheets; process specifications; instructions from supervisor PC7. establish the procedures to complete the general machining, fitting or assembling operations PC8. obtain the appropriate equipment, parts and accessories for the general machining, fitting or assembling operation Equipment: rollers and skates; crowbars; pull-lifts; lubricated plates Parts: assembly structure (framework, support, casings, panels); pre-machined components; shafts; levers/linkages; springs; fabricated components; chains; keys; belts; bearing; couplings; pulleys; gaskets; seals; sprockets; gears; pipework/hoses; bushes; cams and followers; other specific components Accessories for assembling: hooks, slings, eyebolts, shackles, chains, rings, special-to-purpose equipment, rules for the use of slings, trolleys PC9. check that all measuring equipment is within calibration date Measuring equipments: external micrometers, vernier/digital/dial caliper, surface finish equipment (eg. comparison plates, machines), rules, squares, protractors, depth micrometers, depth verniers, feeler gauges, bore/hole gauges, slip gauges, radius/profile gauges, thread gauges, height gauge, hardness tester, dial test indicators (DTI), surface roughness tester, coordinate measuring machine (CMM), profile projectors, form testers
Mark out the components	To be competent, the user/individual on the job must be able to: PC10. prepare/determine suitable datums from which to mark out (eg. choosing a machine face or filing a flat face as a datum) PC11. apply a marking medium to enhance clarity of the marking out PC12. use an appropriate method of marking out (eg. direct marking using instruments, use of templates or tracing/transfer methods) PC13. use a range of marking out equipment (eg. rules, squares, scribers, vernier instruments) Marking tools: rules/tapes, dividers/trammels, scribers, punches, scribing blocks, squares, protractor, permanent markers PC14. mark out a range of features Features: datum lines; cutting guidelines; square and rectangular profiles; circular and radial profiles; angles; holes linearly positioned, boxed and on

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	pitch circles
Perform general fitting operations	To be competent, the user/individual on the job must be able to: PC15. cut and shape the materials to the required specification, using appropriate tools and techniques PC16. use a range of hand fitting methods for fitting operations Hand fitting: cutting out the rough profile using saws (eg. hacksaw, band saw), cutting a screw thread (eg. tapping or dieing), filing (flat, square, curved), drilling holes, reaming of holes, scrabbing of parts PC17. use a range of manually operated machines for performing machining operations Manually operated machine tools: manual grinding machines (Ag4, wolf grinding machine, etc.), drills (power drills, pedestal drills), punching machines, threading machines
Perform assembling operations	To be competent, the user/individual on the job must be able to: PC18. use appropriate methods and techniques to assemble and secure the components and sub-assemblies in their correct positions Methods: assembling components having interference fits (eg. by pressure, expansion or contraction); securing components using threaded fasteners (eg. nuts, bolts, machine screws, cap screws); securing components using spring clips (eg. external circlips, internal circlips, special clips); using locking and retaining devices (eg. tab washers, locking nuts, wire locks, special purpose types); securing components using rivets (eg. countersunk, roundhead, blind, special purpose types); applying sealing compounds or adhesives; electrical bonding of components; setting and adjusting components to give correct working parameters (eg. shimming and packing); torque setting of nuts and bolts PC19. drill, tap and ream locating holes as required to permanently locate components PC20. fasten components permanently using methods such as using engineered fasteners, applying adhesives, soldering and brazing PC21. produce mechanical assemblies as per job specifications PC22. dismantle mechanical assemblies without damage to components and/or subassemblies Methods to dismantle: procedure for isolation and locking off a device/system; sequence of operations used to dismantle a device/system; proof marking, correct storage procedures for removed parts; release of pressure/force; extraction PC23. deal promptly and effectively with problems within their control, and seek help and guidance from the relevant people if they have problems that they cannot resolve

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	PC24. keep the work area in a safe and tidy condition during and on completion of the manufacturing activities PC25. return all tools and equipment to the correct location on completion of the fitting activities support the customer remotely over the internet to test potential solutions Fitting activities: file flat, square and curved surfaces and achieve a smooth surface finish; select saw blades for different materials, and how to set the saw blades for different operations; produce screw threads on workpieces using hand dies; tighten torque with torque wrenches; determine the drill size for tapped holes, and the importance of using the taps in the correct sequence
Measure and checking component	To be competent, the user/individual on the job must be able to: PC26. perform the necessary checks for dimensional accuracy Dimensions: linear dimensions (eg. lengths, depths), diameters (eg. external,internal), flatness, squareness, angles, profiles, hole size and position, thread size and fit PC27. use the appropriate measuring equipment for checking activities PC28. produce components within all of the applying standards Components quality standards: components to be free from false tool cuts, burrs and sharp edges; dimensional tolerance +/-0.020mm; flatness and squareness 0.05mm; angles within +/- 1 degree; screw threads to fit as per standard; reamed and bored holes within interference: - 0.025mm (hole) + 0.025mm (shaft), transition: - 0.1mm (hole) + 0.1 (shaft, clearance: 50microns; radius: 0.5 r; surface finish 63µin or 1.6 µm PC29. generate stage inspection reports
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. legislation, standards, policies, and procedures followed in the company relevant to own employment and performance conditions KA2. relevant health and safety requirements applicable in the work place KA3. importance of working in clean and safe environment KA4. own job role and responsibilities and sources for information pertaining to employment terms, entitlements, job role and responsibilities KA5. reporting structure, inter-dependent functions, lines and procedures in the work area KA6. relevant people and their responsibilities within the work area KA7. escalation matrix and procedures for reporting work and employment related issues KA8. documentation and related procedures applicable in the context of

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	employment and work KA9. importance and purpose of documentation in context of employment and work
B. Technical Knowledge	The user/individual on the job needs to know and understand: KB1. how to extract and use information from engineering drawings and related specifications in relation to work undertaken KB2. how to interpret first and third angle drawings, imperial and metric systems of measurement, workpiece reference points and system of tolerancing (Geometric Dimensioning and Tolerancing -- GD&T) KB3. preparation of materials in readiness for the marking out activities, in order to enhance clarity, accuracy and safety KB4. selection and establishment of a suitable datum KB5. importance of ensuring that marking out is undertaken from the selected datum KB6. possible effects of working from an incorrect datum KB7. mark-out conventions when marking out the workpiece KB8. various fitting activities to be carried out Fitting activities: file flat, square and curved surfaces and achieve a smooth surface finish; select saw blades for different materials, and how to set the saw blades for different operations; produce screw threads on workpieces using hand dies; tighten torque with torque wrenches; determine the drill size for tapped holes, and the importance of using the taps in the correct sequence KB9. methods of holding the workpiece for the hand fitting, drilling threading and taping activities KB10. how to mount workpiece KB11. assembly methods, techniques and procedures to be used Methods: assembling components having interference fits (eg. by pressure, expansion or contraction); securing components using threaded fasteners (eg. nuts, bolts, machine screws, cap screws); securing components using spring clips (eg. external circlips, internal circlips, special clips); using locking and retaining devices (eg. tab washers, locking nuts, wire locks, special purpose types); securing components using rivets (eg. countersunk, roundhead, blind, special purpose types); applying sealing compounds or adhesives; electrical bonding of components; setting and adjusting components to give correct working parameters (eg. shimming and packing); torque setting of nuts and bolts KB12. how the components are to be aligned, adjusted and positioned prior to securing them, and the tools and equipment Alignment: slideways: flat, vee, dovetail, cylindrical, comparison of their

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	capabilities, main features, accuracy of movement, means of adjustment, lubrication, protection; stick-slip: definition, recirculating ball leadscrews, hydrostatic slides; typical checks:coaxial alignment between main spindle axis, coaxial alignment between two spindles, alignment of spindle to guideway, squareness of slideways movement, concentricity and end float of spindle, squareness of planes to spindle, setting of guards, stops and automatic safety cut-outs; bearings: plain bush (radial, radial and axial) ball (radial, axial, radial and axial) roller (radial, axial, radial and axial); methods of alignment: standard tests, straight edge, precision level, autocollimator and reflector, roundness measuring machine KB13. various mechanical fastening devices that are used Mechanical fastenings and joining techniques: non-permanent - nuts, bolts, studs, screws, pins, springs, keys, bearings, permanent - welded, soldered, brazed, riveted KB14. how to mount and secure the cutting tools in the tool holding devices Workholding devices: bench / machine vice; clamps (eg. toolmaker's); three-jaw chuck; four-jaw chuck; collet chuck; drive plate and centres; magnetic chucks(holding devices); special purpose tool holders (3R for holding electrodes) KB15. techniques of taking trial cuts and checking dimensional accuracy KB16. the application of roughing and finishing cuts, and the effect on tool life, surface finish and dimensional accuracy KB17. application of cutting fluids and compounds with regard to a range of different materials, and why some materials do not require cutting fluids to be used Range of Materials: Ferrous metals: eg. carbon steels, stainless steels, cast iron, tool steel, hard metals; Non-ferrous metals: eg. bronze, aluminium, copper and copper alloys KB18. effects of coolant concentration and machining temperature on the job being undertaken KB19. how to check the workpiece and the measuring equipment that is used Measuring equipments: external micrometers, vernier/digital/dial caliper, surface finish equipment (eg. comparison plates, machines), rules, squares, protractors, depth micrometers, depth verniers, feeler gauges, bore/hole gauges, slip gauges, radius/profile gauges, thread gauges, height gauge, hardness tester, dial test indicators (DTI), surface roughness tester, coordinate measuring machine (CMM), profile projectors, form testers KB20. need to check that the measuring equipment is within current calibration dates, and that the instruments are correctly zeroed KB21. measuring internal and external dimensions

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	KB22. measuring geometric features KB23. the importance of leaving the work area and equipment in a safe and clean condition on completion of fitting activities
Skills (S)	
A. Core Skills/ GenericSkills	**Reading Skills**
	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 numerical operations, and calculations/ formulae Numerical computations: addition, subtraction, multiplication, division, fractions and decimals, percentages and proportions, simple ratios and averages SA4. identify and draw various basic, compound and solid shapes as per dimensions given Basic shapes: square, rectangle, triangle, circle 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. interpret and express tolerance in terms of limits on dimensions SA8. calculation of the value of angles in a triangle SA9. Angles in a triangle: right-angled, isosceles, equilateral
	Oral Communication (Listening and Speaking skills)
	The user/individual on the job needs to know and understand how to: SA10. convey and share technical information clearly using appropriate language SA11. check and clarify task-related information SA12. liaise with appropriate authorities using correct protocol SA13. communicate with people in respectful form and manner in line with organizational protocol
B. Professional Skills	**Decision Making**

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	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
	CustomerCentricity
	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:

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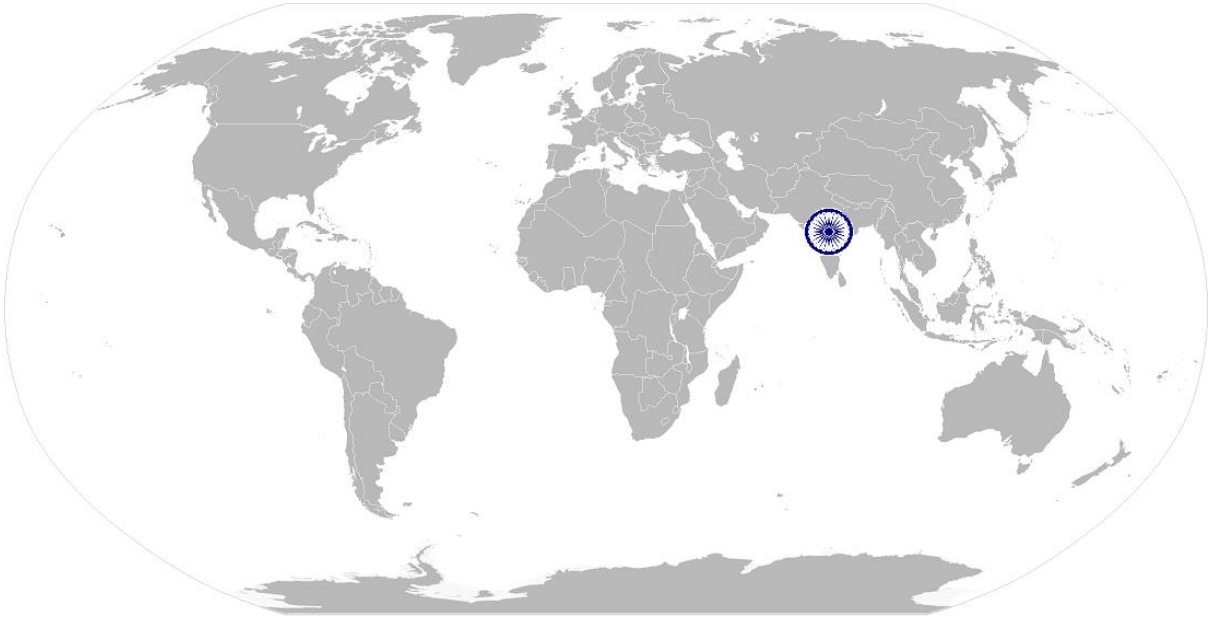
	SB23. participate in on-the-job and other learning, training and development interventions and assessments SB24. clarify task related information with appropriate personnel or technical adviser SB25. seek to improve and modify own work practices SB26. maintain current knowledge of application standards, legislation, codes of practice and product/process developments



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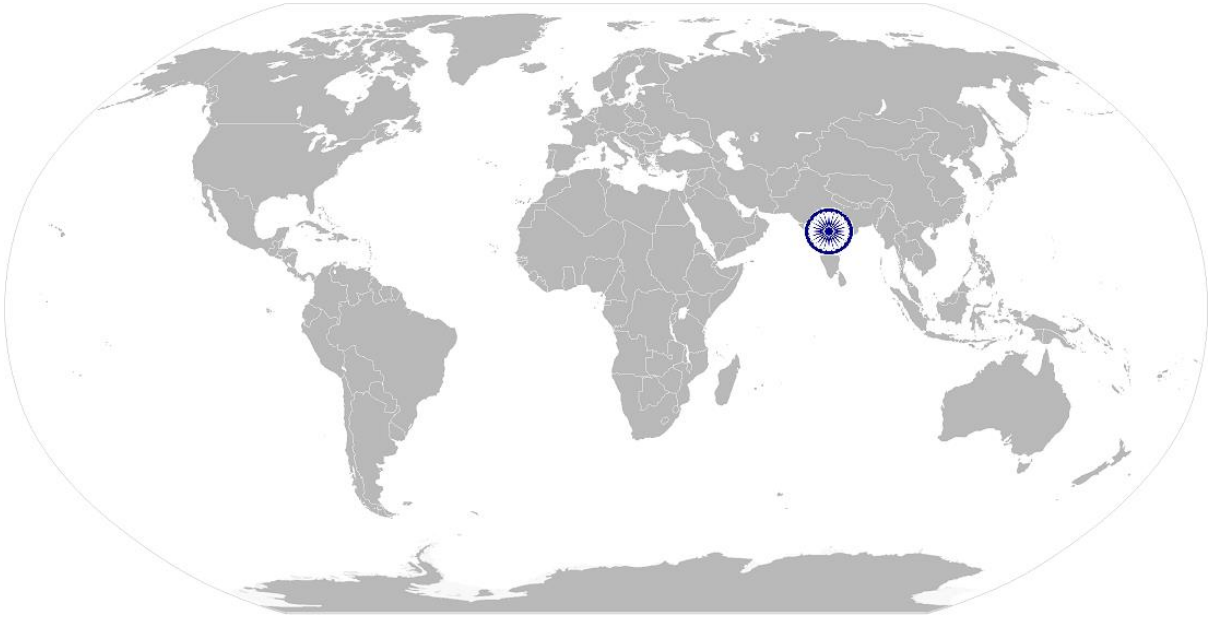
NOS Version Control

NOS Code	**CSC/N0304**		
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 5. Process Plant Machinery 6. Electrical and Power Machinery 7. Light Engineering Goods**	**Last reviewed on**	**24/11/2017**
Occupation	**Fitting and Assembly**	**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

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

	drunkenness); health hazards (such as untreated injuries and contagious 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

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

	Documents: fire notices, accident reports, safety instructions for equipment and procedures, company notices and documents, legal documents (eg 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

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

	emergency
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.

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

	KB14. techniques of using the different fire extinguishers KB15. different methods of extinguishing fire 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

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	CustomerCentricity
	The user/individual on the job needs to know and understand how to: 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

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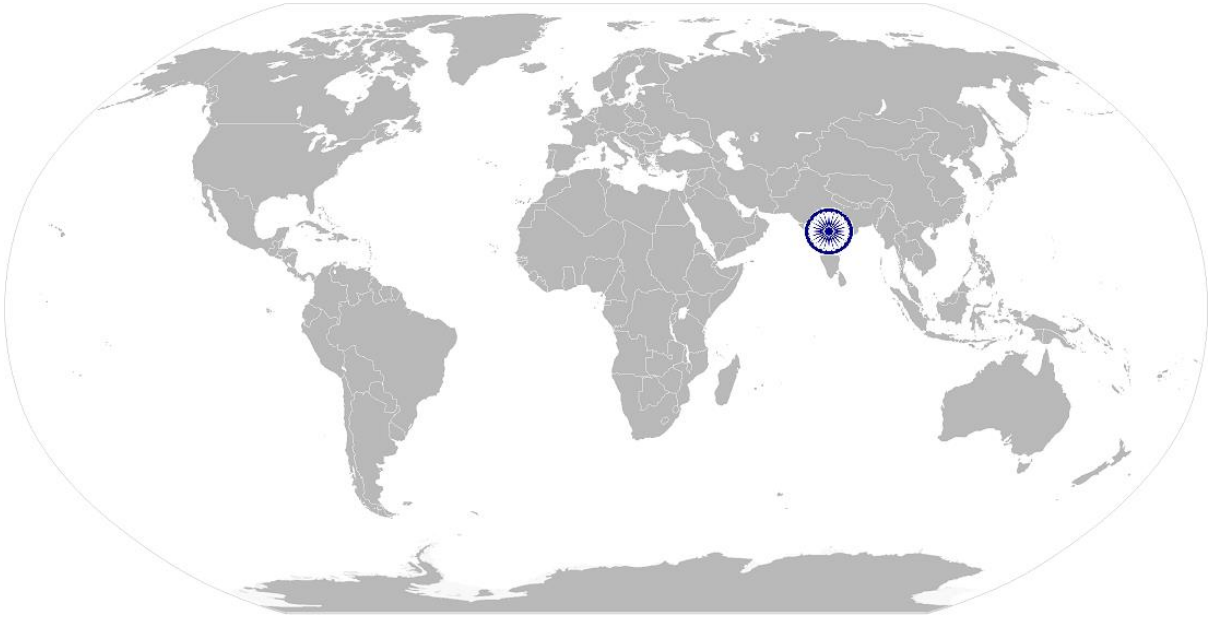
NOS Version Control

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 5. Process Plant Machinery 6. Electrical and Power Machinery 7. Light Engineering Goods	Last reviewed on	24/11/2017
Occupation	Fitting and Assembly	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. accurately receive information and instructions from the supervisor and fellow workers, getting clarification where required PC2. accurately pass on information 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	**ReadingSkills**
	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

NOS Code	CSC/N1336		
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 5. Process Plant Machinery 6. Electrical and Power Machinery 7. Light Engineering Goods	Last reviewed on	24/11/2017
Occupation	Fitting and Assembly	Next review date	24/11/2021

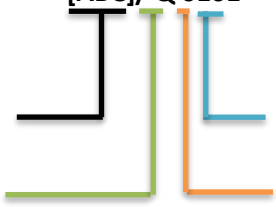
Annexure

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)

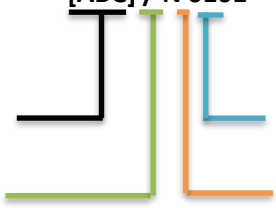
Occupation (2 numbers)

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: Fitter - Mechanical Assembly

Qualification Pack: CSC/Q0304

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/N0304 Perform fitting and assembly operations on metal components	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 broaching 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 machines and machine tools are secured at all times		2	0	2
	PC6. determine job requirement from job specification documents obtained from valid sources		3	1	2

	PC7. establish the procedures to complete the general machining, fitting or assembling operations		3	1	2
	PC8. obtain the appropriate tools and equipment for the general machining, fitting or assembling operation		2	1	1
	PC9. check that all measuring equipment is within calibration date		3	0	3
	PC10. prepare/determine suitable datums from which to mark out (eg. choosing a machine face or filing a flat face as a datum, etc.)		3	1	2
	PC11. apply a marking medium to enhance clarity of the marking out		2	0	2
	PC12. use an appropriate method of marking out (eg. direct marking using instruments, use of templates or tracing/transfer methods, etc.)		3	1	2
	PC13. use a range of marking out equipment (eg. rules, squares, scribers, vernier instruments, etc.)		5	2	3
	PC14. mark out a range of features		3	1	2
	PC15. cut and shape the materials to the required specification, using appropriate tools and techniques		5	2	3
	PC16. use a range of hand fitting methods for fitting operations		4	1	3
	PC17. use a range of manually operated machines for performing machining operations		4	1	3
	PC18. use appropriate methods and techniques to assemble and secure the components and sub-assemblies in their correct positions		6	2	4
	PC19. drill, tap and ream locating holes as required to permanently locate components		5	1	4
	PC20. fasten components permanently using methods such a s using engineered fasteners, applying adhesives, soldering and brazing		5	1	4
	PC21. produce mechanical assemblies as per job specifications		4	1	3
	PC22. dismantle mechanical assemblies without damage to components and/or subassemblies		3	0	3
	PC23. deal promptly and effectively with problems within their control, and seek help and guidance from the relevant people if they have problems that they cannot resolve		3	0	3

	PC24. keep the work area in a safe and tidy condition during and on completion of the manufacturing activities		2	0	2
	PC25. return all tools and equipment to the correct location on completion of the fitting activities;		3	0	3
	PC26. perform the necessary checks for dimensional accuracy		4	1	3
	PC27. use the appropriate measuring equipment for checking activities		4	1	3
	PC28. produce components within all of the applying standards		5	1	4
	PC29. generate stage inspection reports		3	1	2
		Total	**100**	**23**	**77**
CSC/N1335 Use basic health and safety practices at the workplace	PC1.use protective clothing/equipment for specific tasks and work conditions	100	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		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		4	1	3
	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		4	1	3
	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	2	1
	PC25.participate in emergency procedures		2	1	1
	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		3	1	2
		Total	**100**	**37**	**63**
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**