

QUALIFICATIONS PACK - OCCUPATIONAL STANDARDS FOR CAPITAL GOODS INDUSTRY

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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Contents

1. Introduction and Contacts.....	1
2. Qualifications Pack.....	2
3. Glossary of Key Terms.....	4
4. OS Units.....	6
5. Annexure: Nomenclature for QPand OS....	27
6. Assessment Criteria.....	29

Introduction

Qualifications Pack: Sheet Metal Worker – Hand Tools and Manually Operated Machines

SECTOR: CAPITAL GOODS

SUB-SECTOR:

- | | |
|-------------------------------------|------------------------------------|
| 1. Machine Tools | 4. Textile Manufacturing Machinery |
| 2. Plastics Manufacturing Machinery | 5. Electrical and Power Machinery |
| 3. Process Plant Machinery | |

OCCUPATION: Fabrication, Fitting and Assembly

REFERENCE ID: CSC/ Q 0301

ALIGNED TO: NCO 2004/7213.10

Sheet Metal Worker: Perform basic sheet metal (up to and including 3 mm) cutting, forming and assembly operations using hand tools and manually operated machines.

Brief Job Description: It involves using appropriate tools and equipment to mark out the material for a range of features to be produced, using hand tools, portable power tools and simple machines to produce a variety of shapes, profiles and forms, producing simple sheet metal assemblies, using self-secured joints, thermal methods or mechanical fastening devices, inspecting the components after polishing operations and correcting faults.

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/ Q 0301		
	Job Role	Sheet Metal Worker— Hand Tools & Manually Operated Machines		
	Credits (NSQF)	TBD	Version number	1.0
	Sector	CAPITAL GOODS	Drafted on	24/03/14
	Sub-sector	<ol style="list-style-type: none"> 1. Machine Tools 2. Plastics Manufacturing Machinery 3. Textile Manufacturing Machinery 4. Process Plant Machinery 5. Electrical and Power Machinery 	Last reviewed on	18/03/15
	Occupation	FABRICATION, FITTING AND ASSEMBLY	Next review date	30/08/16
	NSQC Clearance on	22/04/2015		

Job Role	Sheet Metal Worker— Hand Tools & Manually Operated Machines
Role Description	Perform basic sheet metal (up to and including 3 mm) cutting, forming and assembly operations.
NSQF level	2
Minimum Educational Qualifications	8 th Standard
Maximum Educational Qualifications	N.A.
Training (Suggested but not mandatory)	No previous training required
Minimum Job Entry Age	18 Years Old
Experience	No previous experience required
Applicable National Occupational Standards (NOS)	<p>Compulsory:</p> <ol style="list-style-type: none"> CSC/ N 0301 (Perform sheet metal cutting, forming and assembly operations) CSC/ N 1335 (Use basic health and safety practices at the workplace) CSC/ N 1336 (Work effectively with others) <p>Optional: N.A.</p>
Performance Criteria	As described in the relevant OS units

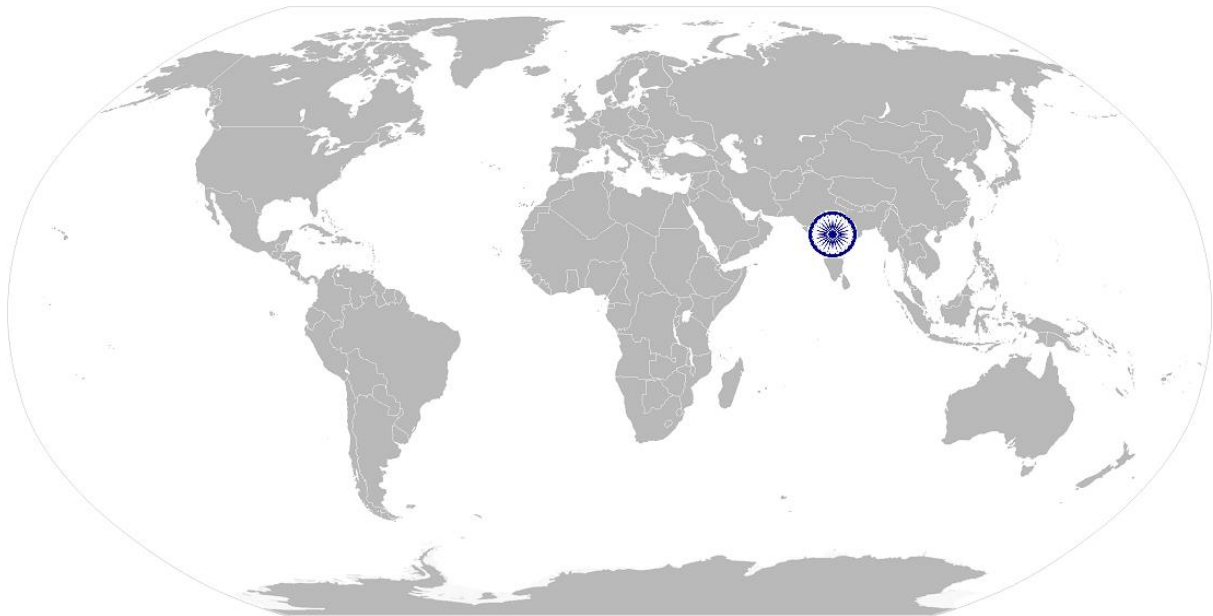
Definitions	Keywords /Terms	Description
	Core Skills/Generic Skills	Core Skills or Generic Skills are a group of skills that are key to learning and working in today's world. These skills are typically needed in any work environment. In the context of the NOS, these include communication related skills that are applicable to most job roles.
	Function	Function is an activity necessary for achieving the key purpose of the sector, occupation, or area of work, which can be carried out by a person or a group of persons. Functions are identified through functional analysis and form the basis of NOS.
	Job role	Job role defines a unique set of functions that together form a unique employment opportunity in an organization.
	Knowledge and Understanding	Knowledge and Understanding are statements which together specify the technical, generic, professional and organizational specific knowledge that an individual needs in order to perform to the required standard.
	National Occupational Standards (NOS)	NOS are Occupational Standards which apply uniquely in the Indian context
	Occupation	Occupation is a set of job roles, which perform similar/related set of functions in an industry.
	Organisational Context	Organisational Context includes the way the organization is structured and how it operates, including the extent of operative knowledge managers have of their relevant areas of responsibility.
	Performance Criteria	Performance Criteria are statements that together specify the standard of performance required when carrying out a task.
	Qualifications Pack(QP)	Qualifications Pack comprises the set of NOS, together with the educational, training and other criteria required to perform a job role. A Qualifications Pack is assigned a unique qualification pack code.
	Qualifications Pack Code	Qualifications Pack Code is a unique reference code that identifies a qualifications pack.
	Scope	Scope is the 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 the quality of performance required.
	Sector	Sector is a conglomeration of different business operations having similar businesses 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.
	Sub-functions	Sub-functions are sub-activities essential to fulfil the achieving the objectives of the function.
	Technical Knowledge	Technical Knowledge is the specific knowledge needed to accomplish specific designated responsibilities.
	Unit Code	Unit Code is a unique identifier for a NOS unit, which can be denoted with an 'N'
Unit Title	Unit Title gives a clear overall statement about what the incumbent should be able to do.	
Vertical	Vertical may exist within a sub-sector representing different domain areas or the client industries served by the industry.	

Acronyms

Keywords /Terms	Description
CO2	Carbon dioxide
CPR	Cardiac Pulmonary Resuscitation
PPE	Personal Protective Equipment

CSC/ N 0301: Perform sheet metal cutting, forming and assembly operations

National Occupational Standard



Overview

This unit covers cutting, forming and assembly operations for basic sheet metal (up to and including 3 mm) using hand tools and manually operated machine tools.

CSC/ N 0301: Perform basic sheet metal cutting, forming and assembly operations

National Occupational Standard	Unit Code	CSC/ N 0301
	Unit Title (Task)	Perform basic sheet metal cutting, forming and assembly operations
	Description	<p>This unit basic sheet (up to and including 3 mm) metalworking using hand tools and manually operated machine tools. This involves preparing for the sheet metalworking activities by obtaining all the necessary job instructions, materials, tools, equipment; studies drawings and other specifications.</p> <p>The candidate will be expected to perform as per instructions under close supervision, demonstrating safe work practices, taking responsibility for own actions and for the quality and accuracy of the work produced.</p>
	Scope	<p>This unit/task covers the following:</p> <ul style="list-style-type: none"> • Working safely • Prepare for performing sheet metal cutting, forming and assembly operations • Mark out the components • Carry out sheet metal cutting and forming operations • Carry out sheet metal assembly operations • Handling of unresolved problems
Performance Criteria(PC) w.r.t. the Scope		
Element	Performance Criteria	
Working safely	<p>PC1. comply with health and safety, environmental and other relevant regulations and guidelines at work and ensure process compliance</p> <p>PC2. adhere to procedures or systems in place for risk assessment, occupational standards, personal protective equipment (PPE) and other relevant occupational safety regulations</p> <p>PC3. work following laid down procedures and instructions</p> <p>PC4. ensure that all tools, equipment, power tool cables, extension leads are in a safe and usable condition and are kept at secured location</p> <p>PC5. ensure that all measuring equipment are within calibration date and are approved for usage</p> <p>Measuring equipment and tools: external micrometers , vernier caliper, surface finish equipment (such as comparison plates), rules, squares, calipers, protractors, depth micrometers, depth verniers, feeler gauges, bore/hole gauges, slip gauges, radius/profile gauges, thread gauges, height gauges</p> <p>PC6. ensure work area is clean and safe from hazards before and after the job is completed</p>	

CSC/ N 0301: Perform basic sheet metal cutting, forming and assembly operations

<p>Prepare for performing sheet metal cutting, forming and assembly operations</p>	<p>PC7. establish job requirements from the supervisor or person in charge Job requirements: materials or components required; dimensions; tolerances; surface texture requirements; inspection requirements; operations required; sequence and procedures; shape or profiles</p> <p>PC8. prepare and maintain the work area as per procedure or operation specification</p> <p>PC9. obtain production and consumables materials required for performing sheet metal cutting, forming and assembly operations as per specifications</p> <p>PC10. obtain tools and equipment required for performing sheet metal cutting, forming and assembly operations as per specifications Sheet metal cutting operations: hand sawing, band sawing, filing, drilling, chiselling, threading, scraping, manually operated lapping Sheet metal forming operations: planishing, raising, hollowing, flangings, 'split and weld' method</p> <p>PC11. ensure that the components used are free from foreign objects, dirt or other contamination</p>
<p>Mark out the components</p>	<p>PC12. prepare the sheet metal for marking out by cleaning it, removing burrs and sharp edges and applying marking out medium</p> <p>PC13. mark out a range of sheet metal materials as per instructions received using specified marking out methods and techniques Sheet metal materials: hot rolled mild steel; cold rolled mild steel; coated mild steel (eg. primed, tinned, galvanized); stainless steel; aluminium Marking methods: direct marking using instruments, use of templates, tracing/transfer methods</p> <p>PC14. use appropriate marking out tools and equipment as per instructions received Marking tools: rules/tapes; straight edge; dividers/trammels; scribes; punches; squares; protractor; chalk, bluing or paint</p> <p>PC15. mark out specified features on the workpieces as per instructions received Features: datum/centre lines; square/rectangular profiles; circles; radial profiles; cutting and bending detail (including allowances); hole centering and outlining (such as circular or linear)</p> <p>PC16. obtain approval from supervisor or person in charge on marked out features and correct errors as per feedback received</p>
<p>Carry out sheet metal cutting and forming operations</p>	<p>PC17. Carry out cutting operations to cut and shape the sheet metal materials as per instructions received Sheet metal cutting operations: hand sawing, band sawing, filing, drilling, chiselling, threading, scraping, manually operated lapping</p> <p>PC18. cut and finish material to the marked-out shape, using a range of hand tools Cutting hand tools: tin snips, hacksaw, hand power tools (such as drill, nibbling, saw), trepanning, bench shears, files, pneumatic tools, thermal device, other specific tool</p> <p>PC19. cut and finish material to the marked-out shape, using a range of manually operated machine tools Manually operated machine cutting tools: guillotine, pillar drill, punch/cropping machine, nibbling machine, mechanical saw, rotary shears, fly press</p>

CSC/ N 0301: Perform basic sheet metal cutting, forming and assembly operations

	<p>PC20. carry out forming operations, to produce sheet metal components that have various shapes as specified using forming hand tools and manually operated tools</p> <p>Sheet metal forming operations: planishing, raising, hollowing, flangings, 'split and weld' method</p> <p>Shapes: bends or flanges; folds/safe edges; wired edges; swages; curved panels; tray/box sections; cylindrical sections; cowlings and rounded covers; square to round trunking</p> <p>Forming hand tools: hammers, mallets, stakes, formers, wooden blocks, sand bags, etc.</p> <p>Manually operated forming machine tools: bending/folding machine (hand or powered), rolling machine (hand or powered), hammers/panel beating equipment, presses</p> <p>PC21. check the cut and formed components, to ensure completeness of work, accuracy in dimensional parameters and freedom from damage or wrong tool cuts</p> <p>Dimensional parameters: linear dimensions; flatness; squareness; angles; profiles; hole position; hole size/fit; depths; thread size and fit; surface finish</p>
<p>Carry out sheet metal assembly operations</p>	<p>PC22. use the appropriate methods and techniques to assemble and secure the components in their correct positions</p> <p>Assembly methods: self-secured joints, thermal methods(soldering, brazing and tack welding), mechanical fastening devices(rivets, nut, bolts, studs, circlips, etc)</p> <p>PC23. use of sheet metalwork assembly and joining techniques to produce fabrications to the required shape/geometry within ± 3.0 mm</p> <p>PC24. produce fabrications that have secure and firm joints and are free from excessive tooling marks, deformation, cracking, sharp edges, slivers or burrs</p> <p>PC25. follow the specified sheet metal cutting, forming and assembly sequence and procedure</p> <p>PC26. monitor the sheet metal cutting, forming and assembly operation and identify any problems that occur</p> <p>PC27. plan and carry out work logically to achieve production targets</p> <p>PC28. deal appropriately with the finished products and complete any necessary documentation</p> <p>PC29. produce products with various features as per standards applicable to the process</p> <p>Features: flat; square; parallel and angular faces; radii and curved profiles; drilled holes; internal and external threads; sliding or mating parts; counterbore, countersink, or spot face</p> <p>PC30. 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</p> <p>PC31. leave the work area in a safe and tidy condition on completion of the fitting activities</p>

CSC/ N 0301: Perform basic sheet metal cutting, forming and assembly operations

Handling of unresolved problems	<p>PC32. refer unresolved job related problems to appropriate personnel for support</p> <p>PC33. monitor the problem and keep the supervisor informed about progress or any delays in resolving the problem</p>
Knowledge and Understanding (K)	
<p>A. Organizational Context (Knowledge of the company / organization and its processes)</p>	<p>The user/individual on the job needs to know and understand:</p> <p>KA1. relevant legislation, standards, policies, and procedures followed in the company relevant to own employment and performance conditions</p> <p>KA2. relevant health and safety requirements applicable in the work place</p> <p>KA3. own job role and responsibilities and sources for information pertaining to employment terms, entitlements, job role and responsibilities</p> <p>KA4. reporting structure, inter-dependent functions, lines and procedures in the work area</p> <p>KA5. how to engage with specialists for support in order to resolve incidents and service requests</p> <p>KA6. importance of working in clean and safe environment practices and procedures</p> <p>KA7. relevant people and their responsibilities within the work area</p> <p>KA8. escalation matrix and procedures for reporting work and employment related issues</p> <p>KA9. documentation and related procedures applicable in the context of employment and work</p>
<p>B. Technical Knowledge</p>	<p>The user/individual on the job needs to know and understand:</p> <p>KB1. specific safe working practices, sheet metal cutting, forming and assembly procedures and environmental regulations that must be observed</p> <p>KB2. hazards associated with carrying out the sheet metal cutting, forming and assembly operations and how can they be minimized</p> <p>KB3. actions to be taken in case of emergencies</p> <p>KB4. how to make sure that the necessary job instructions, operating procedures and sheet metal cutting, forming and assembly specifications are available</p> <p>KB5. tools and equipment used for the sheet metal cutting, forming and assembly operations undertaken, and how to check that they are in a safe and usable condition</p> <p>Sheet metal cutting operations: hand sawing, band sawing, filing, drilling, chiselling, threading, scraping, manually operated lapping</p> <p>Sheet metal forming operations: planishing, raising, hollowing, flangings, 'split and weld' method</p> <p>KB6. how to select and establish a suitable datum while marking out</p> <p>KB7. importance of ensuring that marking out is undertaken from the selected datum and the possible effects of working from a different datum</p> <p>KB8. methods of marking out cutting guidelines for square and rectangular profiles, circular and radial profiles, angles and hole positions</p> <p>KB9. ways of laying out the marking-out shapes or patterns to optimize use of materials</p> <p>KB10. how to cut and form sheet metal using hand tools and manually operated machines</p> <p>Cutting hand tools: tin snips, hacksaw, hand power tools (such as drill, nibbling, saw), trepanning, bench shears, files, pneumatic tools, thermal device, other specific tool</p>

CSC/ N 0301: Perform basic sheet metal cutting, forming and assembly operations

	<p>Forming hand tools: hammers, mallets, stakes, formers, wooden blocks, sand bags, etc.</p> <p>Manually operated cutting machine tools: guillotine, pillar drill, punch/cropping machine, nibbling machine, mechanical saw, rotary shears, fly press</p> <p>Manually operated forming machine tools: bending/folding machine (hand or powered), rolling machine (hand or powered), hammers/panel beating equipment, presses</p> <p>KB11. various forming operations that can be carried out</p> <p>KB12. various methods of securing the assembled components</p> <p>Assembly methods: self-secured joints, thermal methods(soldering, brazing and tack welding), mechanical fastening devices(rivets, nut, bolts, studs, circlips, etc)</p> <p>KB13. importance of using tools or equipment only for the purpose intended</p> <p>KB14. care that is required when using the tools or equipment</p> <p>KB15. problems that can occur in the sheet metal cutting, forming and assembly operation, how to identify them and whom to report them</p> <p>KB16. importance of reporting problems in a timely manner</p> <p>KB17. how to check the quality of the shaped components against the required quality standards</p> <p>Components standards: all dimensions are within +/- 3.0mm; finished products are correctly formed and meet the required shape/geometry (square, straight, angles free from twists); completed products are free from excessive tool or bending marks, stretching or distortion, cracking, sharp edges, slivers or burrs</p> <p>KB18. various sheet metal materials</p> <p>Sheet metal materials: hot rolled mild steel; cold rolled mild steel; coated mild steel (eg. primed, tinned, galvanized); stainless steel; aluminum</p> <p>KB19. how to identify materials by their physical properties</p> <p>Properties: color, appearance, density</p> <p>KB20. physical and mechanical properties of materials</p> <p>Physical properties: melting points of metals, density, color, magnetism, corrosion resistance, conductivity, insulation</p> <p>Mechanical properties: tensile strength, toughness, hardness, elasticity, ductility, malleability</p> <p>KB21. importance of tools and equipment being kept in a safe and usable condition</p> <p>KB22. importance of shutting down the machine and keeping it in secure mode</p> <p>KB23. personal protective equipment (PPE) and clothing that must be worn during the sheet metal cutting activity and from where can it be obtained</p>
Skills (S) [Optional]	
A. Core Skills/ Generic Skills	Communication (Reading, Writing, Listening and Speaking)
	<p>The user/ individual on the job needs to know and understand how to:</p> <p>SA1. read and interpret information correctly from various job specification documents, manuals, health and safety instructions, memos, etc. applicable to the job in English and/or local language</p> <p>SA2. fill up appropriate technical forms, process charts, activity logs as per organizational format in English and/or local language</p>

CSC/ N 0301: Perform basic sheet metal cutting, forming and assembly operations

	<p>SA3. convey and share technical information clearly using appropriate language SA4. check and clarify task-related information SA5. liaise with appropriate authorities using correct protocol SA6. communicate with people in respectful form and manner in line with organizational protocol</p> <p>Numerical and computational skills</p> <p>The user/individual on the job needs to know and understand how to:</p> <p>SA7. undertake basic numerical operations, and calculations/ formulae Numerical computations: addition, subtraction, multiplication, division, fractions and decimals, percentages and proportions, simple ratios and averages</p> <p>SA8. identify 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 Surface areas: cube, rectangular prism, cylinder (curved surface area only) Volumes: cube, rectangular prism, cylinder</p> <p>SA9. use appropriate measuring techniques and units of measurement SA10. use appropriate units and number systems to express degree of accuracy Degree of accuracy: decimals places, significant figures, fractions as a decimal quantity</p> <p>SA11. use metric systems of measurement SA12. calculate the value of angles in a triangle Angles in a triangle: right-angled, isosceles, equilateral</p>
B. Professional Skills	<p>Critical Thinking</p> <p>The user/individual on the job needs to know and understand how to:</p> <p>SA13. participate in on-the-job and other learning, training and development interventions and assessments</p> <p>SA14. clarify task related information with appropriate personnel or technical adviser</p> <p>SA15. seek to improve and modify own work practices</p> <p>SA16. maintain current knowledge of application standards, legislation, codes of practice and product/process developments</p>
	<p>Problem Solving and Decision Making</p> <p>The user/individual on the job needs to know and understand how to:</p> <p>SB1. identify problems with work planning, procedures, output and behavior and their implications</p> <p>SB2. prioritize and plan for problem solving</p> <p>SB3. communicate problems appropriately to others</p> <p>SB4. identify sources of information and support for problem solving</p> <p>SB5. seek assistance and support from other sources to solve problems</p> <p>SB6. identify effective resolution techniques</p> <p>SB7. select and apply resolution techniques</p> <p>SB8. seek evidence for problem resolution</p> <p>Plan and Organize</p>

CSC/ N 0301: Perform basic sheet metal cutting, forming and assembly operations

	<p>The user/individual on the job needs to know and understand how to:</p> <ul style="list-style-type: none"> SB9. plan, prioritize and sequence work operations as per job requirements SB10. organize and analyze information relevant to work SB11. basic concepts of shop-floor work productivity including waste reduction, efficient material usage and optimization of time
	<p>Analytical Thinking</p>
	<p>The user/individual on the job needs to know and understand how to:</p> <ul style="list-style-type: none"> SB12. undertake and express new ideas and initiatives to others SB13. modify work plan to overcome unforeseen difficulties or developments that occur as work progresses SB14. participate in improvement procedures including process, quality and internal/external customer/supplier relationships SB15. one's competencies in new and different situations and contexts to achieve more
	<p>Customer Centricity</p>
	<p>The user/individual on the job needs to know and understand how to:</p> <ul style="list-style-type: none"> SB16. exercise restraint while expressing dissent and during conflict situations SB17. avoid and manage distractions to be disciplined at work SB18. Manage own time for achieving better results
	<p>Teamwork</p>
	<p>The user/individual on the job needs to know and understand how to:</p> <ul style="list-style-type: none"> SB19. work in a team in order to achieve better results SB20. identify and clarify work roles within a team SB21. communicate and cooperate with others in the team for better results SB22. seek assistance from fellow team members

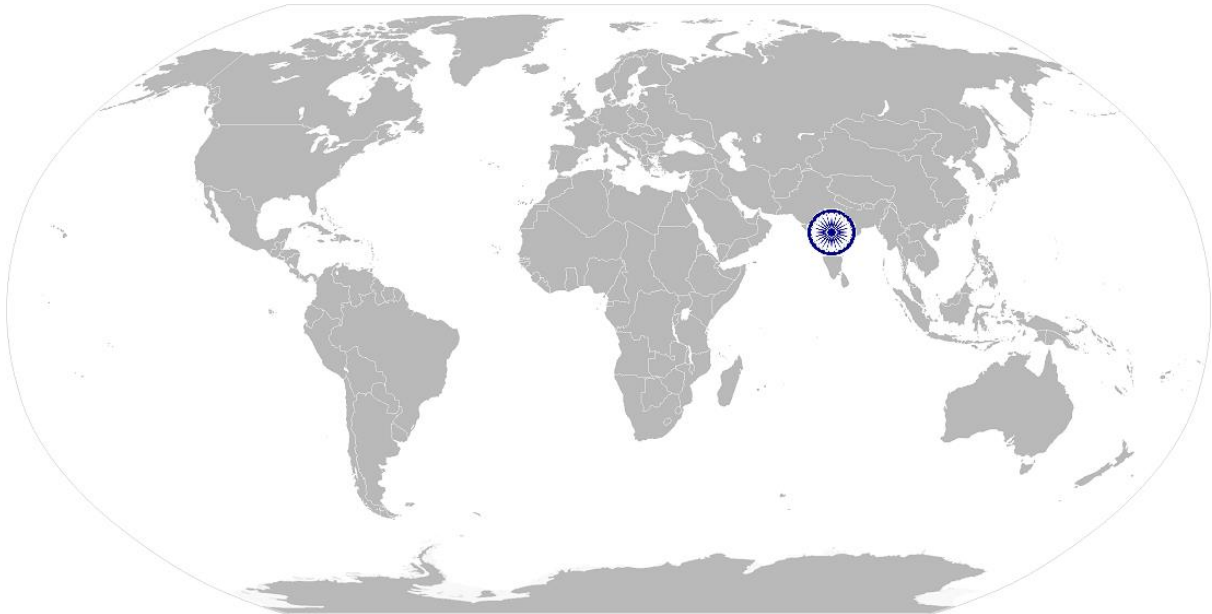
CSC/ N 0301: Perform basic sheet metal cutting, forming and assembly operations

NOS Version Control

NOS Code		CSC/ N 0301	
Credits (NSQF)		Version number	1.0
Industry	CAPITAL GOODS	Drafted on	10/04/14
Industry Sub-sector	1. Machine Tools 2. Plastics Manufacturing Machinery 3. Textile Manufacturing Machinery 4. Process Plant Machinery 5. Electrical and Power Machinery	Last reviewed on	18/03/15
Occupation	Fabrication, Fitting and Assembly	Next Review Date	30/08/16

CSC/ N 1335: 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/ N 1335: Use basic health and safety practices at the workplace

National Occupational Standard	Unit Code	CSC / N 1335
	Unit Title (Task)	Use basic health and safety practices at the workplace
	Description	<p>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.</p> <p>It includes understanding of risks and hazards in the workplace, along with common techniques to minimize risk, deal with accidents, emergencies, etc.</p> <p>It covers knowledge of fire safety, common first aid applications, safe practices and emergency procedures.</p>
	Scope	<p>This unit/task covers the following:</p> <ul style="list-style-type: none"> • Health and safety • Fire safety • Emergencies, rescue and first-aid procedures
Performance Criteria(PC) w.r.t. the Scope		
Element	Performance Criteria	
Health and safety	<p>The user/individual on the job should be able to:</p> <p>PC1. use protective clothing/equipment for specific tasks and work conditions</p> <p>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</p> <p>Equipment: hand shields, machine guards, residual current devices, shields, dust sheets, respirator</p> <p>PC2. state the name and location of people responsible for health and safety in the workplace</p> <p>PC3. state the names and location of documents that refer to health and safety in the workplace</p> <p>PC4. identify job-site hazardous work and state possible causes of risk or accident in the workplace</p> <p>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.)</p>	

CSC/ N 1335: Use basic health and safety practices at the workplace

	<p>Possible causes of risk and accident: physical actions; reading; listening to and giving instructions; inattention; sickness and incapacity (such as drunkenness); health hazards (such as untreated injuries and contagious illness)</p> <p>PC5. carry out safe working practices while dealing with hazards to ensure the safety of self and others</p> <p>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.</p> <p>PC6. state methods of accident prevention in the work environment of the job role</p> <p>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</p> <p>PC7. state location of general health and safety equipment in the workplace</p> <p>General health and safety equipment: fire extinguishers; first aid equipment; safety instruments and clothing; safety installations(eg fire exits, exhaust fans)</p> <p>PC8. inspect for faults, set up and safely use steps and ladders in general use</p> <p>Ladder faults: corrosion of metal components, deterioration, splits and cracks timber components, imbalance, loose rungs, missing/unfixed nuts or bolts, etc.</p> <p>Ladders set up: firm/level base, clip/lash down, leaning at the correct angle, etc.</p> <p>PC9. work safely in and around trenches, elevated places and confined areas</p> <p>PC10. lift heavy objects safely using correct procedures</p> <p>PC11. apply good housekeeping practices at all times</p> <p>Good housekeeping practices: clean/tidy work areas, removal/disposal of waste products, protect surfaces</p> <p>PC12. identify common hazard signs displayed in various areas</p> <p>Various areas: on chemical containers; equipment; packages; inside buildings; in open areas and public spaces, etc.</p> <p>PC13. retrieve and/or point out documents that refer to health and safety in the workplace</p>
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CSC/ N 1335: Use basic health and safety practices at the workplace

	<p>Documents: fire notices, accident reports, safety instructions for equipment and procedures, company notices and documents, legal documents (eg government notices)</p>
<p>Fire safety</p>	<p>The user/individual on the job should be able to:</p> <p>PC14. use the various appropriate fire extinguishers on different types of fires correctly</p> <p>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)</p> <p>PC15. demonstrate rescue techniques applied during fire hazard</p> <p>PC16. demonstrate good housekeeping in order to prevent fire hazards</p> <p>PC17. demonstrate the correct use of a fire extinguisher</p>
<p>Emergencies, rescue and first-aid procedures</p>	<p>The user/individual on the job should be able to:</p> <p>PC18. demonstrate how to free a person from electrocution</p> <p>PC19. administer appropriate first aid to victims where required eg. in case of bleeding, burns, choking, electric shock, poisoning etc.</p> <p>PC20. demonstrate basic techniques of bandaging</p> <p>PC21. respond promptly and appropriately to an accident situation or medical emergency in real or simulated environments</p> <p>PC22. perform and organize loss minimization or rescue activity during an accident in real or simulated environments</p> <p>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</p> <p>PC24. demonstrate the artificial respiration and the CPR Process</p> <p>PC25. participate in emergency procedures</p> <p>Emergency procedures: raising alarm, safe/efficient, evacuation, correct means of escape, correct assembly point, roll call, correct return to work</p> <p>PC26. complete a written accident/incident report or dictate a report to another person, and send report to person responsible</p> <p>Incident Report includes details of: name, date/time of incident, date/time of report, location, environment conditions, persons involved, sequence of events, injuries sustained, damage sustained, actions taken, witnesses, supervisor/manager notified</p> <p>PC27. demonstrate correct method to move injured people and others during an emergency</p>
<p>Knowledge and Understanding (K)</p>	

CSC/ N 1335: Use basic health and safety practices at the workplace

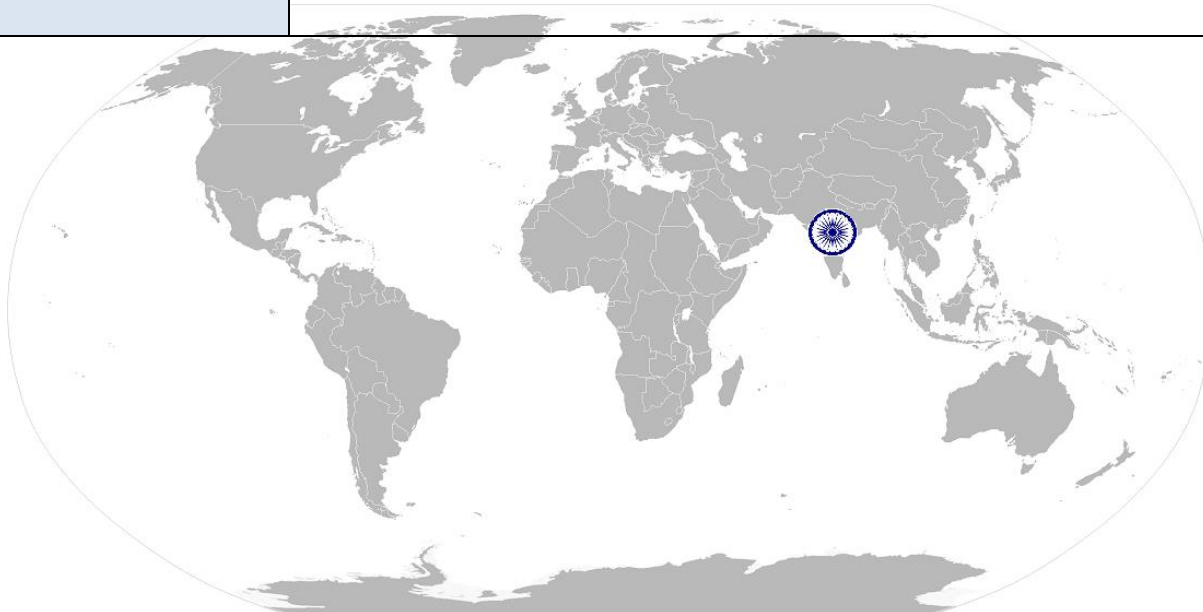
<p>A. Organizational Context (Knowledge of the company / organization and its processes)</p>	<p>The user/individual on the job needs to know and understand:</p> <p>KA1. names (and job titles if applicable), and where to find, all the people responsible for health and safety in a workplace.</p> <p>KA2. names and location of documents that refer to health and safety in the workplace.</p>
<p>B. Technical Knowledge</p>	<p>The user/individual on the job needs to know and understand:</p> <p>KB1. meaning of “hazards” and “risks”</p> <p>KB2. health and safety hazards commonly present in the work environment and related precautions</p> <p>KB3. possible causes of risk, hazard or accident in the workplace and why risk and/or accidents are possible</p> <p>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)</p> <p>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</p> <p>KB6. safe working practices when working with tools and machines</p> <p>KB7. safe working practices while working at various hazardous sites</p> <p>KB8. where to find all the general health and safety equipment in the workplace</p> <p>KB9. various dangers associated with the use of electrical equipment</p> <p>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</p> <p>KB11. importance of using protective clothing/equipment while working</p> <p>KB12. precautionary activities to prevent the fire accident</p> <p>KB13. various causes of fire Causes of fires: heating of metal; spontaneous ignition; sparking; electrical heating; loose fires (smoking, welding, etc.); chemical fires; etc.</p> <p>KB14. techniques of using the different fire extinguishers</p> <p>KB15. different methods of extinguishing fire</p> <p>KB16. different materials used for extinguishing fire Materials: sand, water, foam, CO₂, dry powder</p> <p>KB17. rescue techniques applied during a fire hazard</p> <p>KB18. various types of safety signs and what they mean</p>

CSC/ N 1335: Use basic health and safety practices at the workplace

	<p>KB19. appropriate basic first aid treatment relevant to the condition eg. shock, electrical shock, bleeding, breaks to bones, minor burns, resuscitation, poisoning, eye injuries</p> <p>KB20. content of written accident report</p> <p>KB21. potential injuries and ill health associated with incorrect manual handling</p> <p>KB22. safe lifting and carrying practices</p> <p>KB23. personal safety, health and dignity issues relating to the movement of a person by others</p> <p>KB24. potential impact to a person who is moved incorrectly</p>
Skills (S) [Optional]	
A. Core Skills/ Generic Skills	Reading and Writing 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 and 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:	
SA4. question coworkers appropriately in order to clarify instructions and other issues	
SA5. give clear instructions to coworkers, subordinates others	
Decision Making	
The user/individual on the job needs to know and understand how to:	
SA6. 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	
B. Professional Skills	Plan and Organize
	The user/individual on the job needs to know and understand how to:
	SB1. plan and organize their own work schedule, work area, tools, equipment and materials to maintain decorum and for improved productivity
	Working with others
The user/individual on the job needs to know and understand how to:	
SB2. remain congenial while discussing and debating issues with co-workers	
SB3. follow appropriate protocols for communication based on situation, hierarchy, organizational culture and practice	
SB4. ask for, provide and receive required assistance where possible to ensure achievement of work related objectives	
SB5. thank coworkers for any assistance received	
SB6. offer appropriate respect based on mutuality and respect for fellow workmanship and authority	

CSC/ N 1335: Use basic health and safety practices at the workplace

	Problem Solving
	<p>The user/individual on the job needs to know and understand how to:</p> <ul style="list-style-type: none"> SB7. think through the problem, evaluate the possible solution(s) and suggest an optimum /best possible solution(s) SB8. identify immediate or temporary solutions to resolve delays SB9. identify sources of support that can be availed of for problem solving for various kind of problems SB10. seek appropriate assistance from other sources to resolve problems SB11. report problems that you cannot resolve to appropriate authority
	Analytical Thinking
	<p>The user/individual on the job needs to know and understand how to:</p> <ul style="list-style-type: none"> SB12. identify cause and effect relations in their area of work SB13. use cause and effect relations to anticipate potential problems and their solution



CSC/ N 1335: Use basic health and safety practices at the workplace

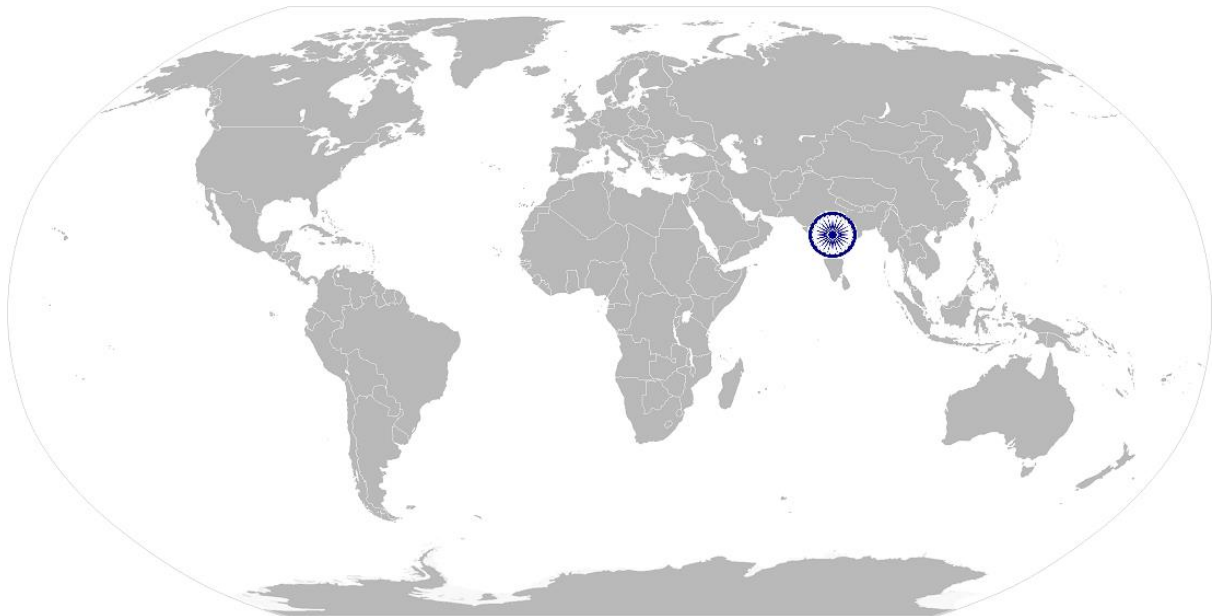
NOS Version Control

NOS Code	CSC / N 1335		
Credits (NSQF)	TBD	Version number	1.0
Industry	Capital Goods	Drafted on	10/04/14
Industry Sub-sector	<ol style="list-style-type: none"> 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 Generation Machinery 7. Light Engineering Goods 	Last reviewed on	18/03/15
Occupation	Fabrication, Fitting and Assembly	Next review date	30/08/16

CSC/ N 1336:

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/ N 1336:

Work effectively with others

National Occupational Standard

Unit Code	CSC / N 1336
Unit Title (Task)	Work effectively with others
Description	<p>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.</p> <p>These cover areas such as communication etiquette, discipline, listening, handling conflict and grievances.</p>
Scope	<p>This unit/task covers the following:</p> <ul style="list-style-type: none"> Working with others
Performance Criteria (PC) w.r.t. the Scope	
Element	Performance Criteria
Working with others	<p>The user/individual on the job should be able to:</p> <p>PC1. accurately receive information and instructions from the supervisor and fellow workers, getting clarification where required</p> <p>PC2. accurately pass on information to authorized persons who require it and within agreed timescale and confirm its receipt</p> <p>PC3. give information to others clearly, at a pace and in a manner that helps them to understand</p> <p>PC4. display helpful behavior by assisting others in performing tasks in a positive manner, where required and possible</p> <p>PC5. consult with and assist others to maximize effectiveness and efficiency in carrying out tasks</p> <p>PC6. display appropriate communication etiquette while working</p> <p>Communication etiquette: do not use abusive language; use appropriate titles and terms of respect; do not eat or chew while talking (vice versa)etc.</p> <p>PC7. display active listening skills while interacting with others at work</p> <p>PC8. use appropriate tone, pitch and language to convey politeness, assertiveness, care and professionalism</p> <p>PC9. demonstrate responsible and disciplined behaviors at the workplace</p> <p>Disciplined behaviors: e.g. punctuality; completing tasks as per given time and standards; not gossiping and idling time; eliminating waste, honesty, etc.</p> <p>PC10. escalate grievances and problems to appropriate authority as per procedure to resolve them and avoid conflict</p>
Knowledge and Understanding (K)	
A. Organizational Context (Knowledge of the company / organization and its processes)	<p>The user/individual on the job needs to know and understand:</p> <p>KA1. legislation, standards, policies, and procedures followed in the company relevant to own employment and performance conditions</p> <p>KA2. reporting structure, inter-dependent functions, lines and procedures in the work area</p> <p>KA3. relevant people and their responsibilities within the work area</p> <p>KA4. escalation matrix and procedures for reporting work and employment related issues</p>

CSC/ N 1336:

Work effectively with others

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) [Optional]



CSC/ N 1336:

Work effectively with others

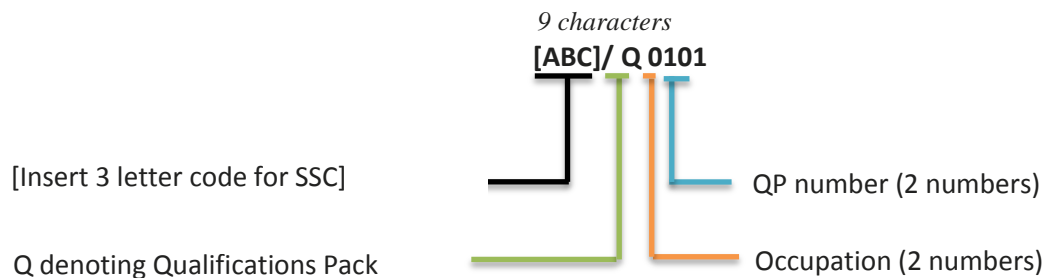
NOS Version Control

NOS Code	CSC / N 1336		
Credits(NSQF)	TBD	Version number	1.0
Industry	Capital Goods	Drafted on	10/04/14
Industry Sub-sector	<ol style="list-style-type: none"> 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	18/03/15
Occupation	Fabrication, Fitting and Assembly	Next review date	30/08/16

Annexure

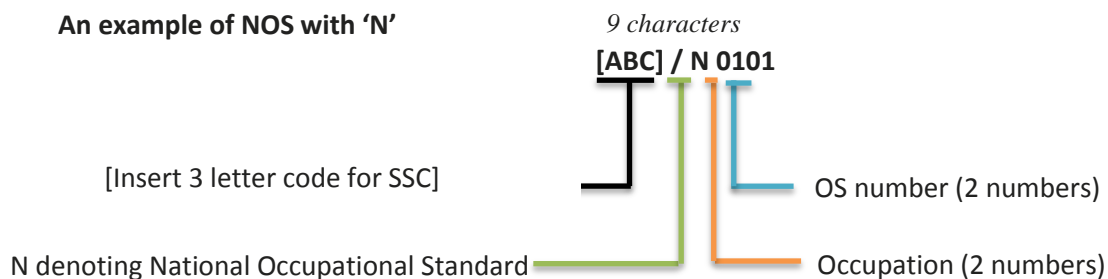
Nomenclature for QP and NOS

Qualifications Pack



Occupational Standard

An example of NOS with 'N'



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
Plastics 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 QP or NOS	N
Next two numbers	Occupation code	01
Next two numbers	OS number	01

CRITERIA FOR ASSESSMENT OF TRAINEES

Job Role Sheet Metal Worker- Hand Tools and Manually Operated Machines
Qualification Pack CSC/ Q 0301
Sector Skill Council Capital Goods Sector Skills 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. Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training centre (as per assessment criteria below)
4. Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/training centre based on this criteria
5. To pass the Qualification Pack , every trainee should score a minimum of 70% in every NOS
6. In case of successfully passing only certain number of NOS's, the trainee is eligible to take subsequent assessment on the balance NOS's to pass the Qualification Pack.

Assessment outcomes	Assessment Criteria	Total Marks	Out of	Theory	Practical Skill
CSC/ N 0301: Perform sheet metal cutting, forming and assembly operations	PC1. comply with health and safety, environmental and other relevant regulations and guidelines at work and ensure process compliance		3	1	2
	PC2. adhere to procedures or systems in place for risk assessment, occupational standards, personal protective equipment (PPE) and other relevant occupational safety regulations		4	1	3
	PC3. work following laid down procedures and instructions		2	0	2
	PC4. ensure that all tools, equipment, power tool cables, extension leads are in a safe and usable condition and are kept at secured location		3	0	3
	PC5. ensure that all measuring equipment are within calibration date and are approved for usage		3	0	3
	PC6. ensure work area is clean and safe from hazards before and after the job is completed		3	0	3

PC7. establish job requirements from the supervisor or person in charge	3	1	2
PC8. prepare and maintain the work area as per procedure or operation specification	2	0	2
PC9. obtain production and consumables materials required for performing sheet metal cutting, forming and assembly operations as per specifications	3	0	3
PC10. obtain tools and equipment required for performing sheet metal cutting, forming and assembly operations as per specifications	3	1	2
PC11. ensure that the components used are free from foreign objects, dirt or other contamination	2	0	2
PC12. prepare the sheet metal for marking out by cleaning it, removing burrs and sharp edges and applying marking out medium	3	1	2
PC13. mark out a range of sheet metal materials as per job specifications using specified marking out methods and techniques	3	1	2
PC14. use appropriate marking out tools and equipment as per instructions received	2	0	2
PC15. mark out specified features on the workpieces as per instructions received	4	1	3
PC16. obtain approval from supervisor or person in charge on marked out features and correct errors as per feedback received	2	0	2
PC17. cut and shape the sheet metal materials to the required specification, using appropriate tools and techniques	4	1	3
PC18. cut and finish material to the marked-out shape, using a range of hand tools	4	1	3
PC19. cut and finish material to the marked-out shape, using a	4	1	3

range of manually operated machine tools			
PC20. carry out forming operations, to produce sheet metal components that have various shapes as specified	4	1	3
PC21. check the cut and formed components, to ensure completeness of work, accuracy in dimensional parameters and freedom from damage or wrong tool cuts	4	1	3
PC22. use the appropriate methods and techniques to assemble and secure the components in their correct positions	4	1	3
PC23. use of sheet metalwork assembly and joining techniques to produce fabrications to the required shape/geometry within ± 3.0 mm	4	1	3
PC24. produce fabrications that have secure and firm joints and are free from excessive tooling marks, deformation, cracking, sharp edges, slivers or burrs	3	0	3
PC25. follow the specified sheet metal cutting, forming and assembly sequence and procedure	4	1	3
PC26. monitor the sheet metal cutting, forming and assembly operation and identify any problems that occur	2	1	1
PC27. plan and carry out work logically to achieve production targets	1	0	1
PC28. deal appropriately with the finished products and complete any necessary documentation	3	1	2
PC29. produce products with various features as per standards applicable to the process	4	1	3
PC30. deal promptly and effectively with problems within their control, and seek help and guidance from the relevant people	2	0	2

	if they have problems that they cannot resolve				
	PC31. leave the work area in a safe and tidy condition on completion of the fitting activities		2	0	2
	PC32. refer unresolved job related problems to appropriate personnel for support		3	1	2
	PC33. monitor the problem and keep the supervisor informed about progress or any delays in resolving the problem		3	1	2
		Total	100	20	80
CSC/ N 1335 (Use basic health and safety practices at the workplace)	PC1. use protective clothing/equipment for specific tasks and work conditions	100	5	2	3
	PC2. state the name and location of people responsible for health and safety in the workplace		3	1	2
	PC3. state the names and location of documents that refer to health and safety in the workplace		3	1	2
	PC4. identify job-site hazardous work and state possible causes of risk or accident in the workplace		5	2	3
	PC5. carry out safe working practices while dealing with hazards to ensure the safety of self and others state methods of accident prevention in the work environment of the job role		4	2	2
	PC6. state location of general health and safety equipment in the workplace		3	2	1
	PC7. inspect for faults, set up and safely use steps and ladders in general use		5	2	3
	PC8. work safely in and around trenches, elevated places and confined areas		5	2	3
	PC9. lift heavy objects safely using correct procedures		5	2	3
	PC10. apply good housekeeping practices at all times		4	2	2
	PC11. identify common hazard signs displayed in various areas		5	2	3

PC12. retrieve and/or point out documents that refer to health and safety in the workplace	3	1	2
PC13. use the various appropriate fire extinguishers on different types of fires correctly	4	1	3
PC14. demonstrate rescue techniques applied during fire hazard	4	1	3
PC15. demonstrate good housekeeping in order to prevent fire hazards	3	1	2
PC16. demonstrate the correct use of a fire extinguisher	4	1	3
PC17. demonstrate how to free a person from electrocution	4	1	3
PC18. administer appropriate first aid to victims where required eg. in case of bleeding, burns, choking, electric shock, poisoning etc.	4	1	3
PC19. demonstrate basic techniques of bandaging	3	1	2
PC20. respond promptly and appropriately to an accident situation or medical emergency in real or simulated environments	4	1	3
PC21. perform and organize loss minimization or rescue activity during an accident in real or simulated environments	3	1	2
PC22. administer first aid to victims in case of a heart attack or cardiac arrest due to electric shock, before the arrival of emergency services in real or simulated cases	3	1	2
PC23. demonstrate the artificial respiration and the CPR Process	3	1	2
PC24. participate in emergency procedures	3	2	1
PC25. complete a written accident/incident report or dictate a report to another person, and send report to person responsible	4	1	3
PC26. demonstrate correct method to move injured people and others during an emergency	4	1	3

		Total	100	36	64
CSC/ N 1336 (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