

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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Introduction

Qualifications Pack- Forger

SECTOR/S: CAPITAL GOODS

SUB-SECTOR: Light Engineering Goods

OCCUPATION: Forging

REFERENCE ID: CSC/Q1101

ALIGNED TO: NCO-2004/ 7221.10, 7221.30, 7221.50

Brief Job Description: It involves preparing the material using appropriate method, setting up forging machines with dies and presses and using forging techniques so that the material forms the shape as per the die. It also involves checking the prepared components for accuracy.

Personal Attributes: Basic communication, numerical and computational abilities. Openness to learning, ability to plan and organise own work, 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/Q1101		
	Job Role	Forger [Applicable for National Scenarios]		
	Credits	TBD	Version number	1.0
	Sector	Capital Goods	Drafted on	24/04/2014
	Sub-sector	Light Engineering Goods	Last reviewed on	24/11/2017
	Occupation	Forging	Next review date	24/11/2021
	NSQC Clearance on	20/07/2015		

Job Role	Forger
Role Description	Producing of complex solid forged shapes by forging of on ferrous & non-ferrous metals and alloys using a range of forging techniques, tools and jigs, as per approved procedures.
NSQF level	3
Minimum Educational Qualifications	10 th Standard pass, preferably
Maximum Educational Qualifications	Not Applicable
Prerequisite License or Training	No Previous Training Required
Minimum Job Entry Age	18 Years
Experience	No Previous Experience Required
Applicable National Occupational Standards (NOS)	Compulsory: <ol style="list-style-type: none"> 1. CSC/N1101 Perform forging techniques on ferrous & non-ferrous metals and alloys for metalworking 2. CSC/N1001 Perform heat treatment operations on ferrous & non-ferrous metals and alloys using a variety of equipment 3. CSC/N1335 Use basic health and safety practices at the workplace 4. CSC/N1336 Work effectively with others
Performance Criteria	As described in the relevant OS units

Definitions

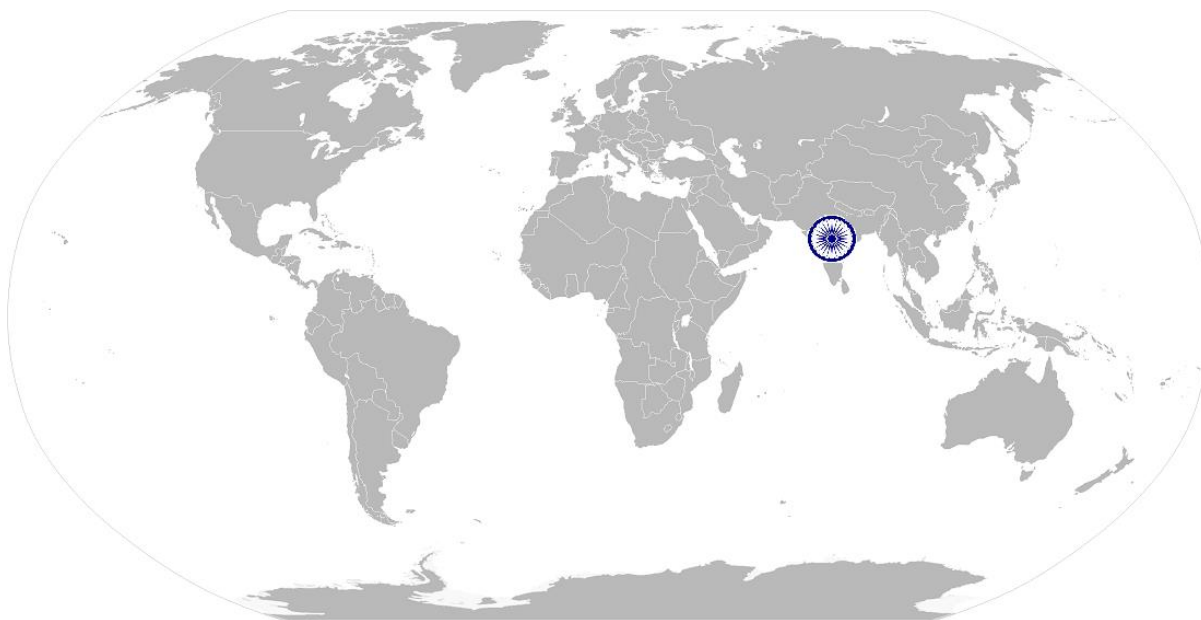
Keywords /Terms	Description
Sector	Sector is a conglomeration of different business operations having similar business and interests. It may also be defined as a distinct subset of the economy whose components share similar characteristics and interests.
Sub-sector	Sub-sector is derived from a further 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.

Acronyms

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.
Keywords /Terms	Description
CO ₂	Carbon Dioxide
CPR	Cardiac Pulmonary Resuscitation
PPE	Personal Protective Equipment

CSC/N1101 Perform forging techniques on ferrous & non-ferrous metals and alloys for metal working

National Occupational Standard



Overview

This unit covers the producing of complex solid forged shapes by forging of on ferrous & non-ferrous metals and alloys using a range of forging techniques, tools and jigs, as per approved procedures.

CSC/N1101 Perform forging techniques on ferrous & non-ferrous metals and alloys for metal working

National Occupational Standard	Unit Code	CSC/N1101
	Unit Title (Task)	Perform forging techniques on ferrous & non-ferrous metals and alloy for metal working
	Description	This unit covers the producing of complex solid forged shapes by forging of on ferrous & non-ferrous metals and alloys using a range of forging techniques, tools and jigs, as per approved procedures. It also setting up and operating forging machine, selecting forming tools and equipment, positioning material, handling materials, selecting and setting up heating equipment, performing heat treatment process(es).
	Scope	<p>This unit/task covers the following:</p> <ul style="list-style-type: none"> • Work safely • Prepare for carryingout forging • Mark out • Perform forging activity
Performance Criteria(PC) w.r.t. the Scope		
Element	Performance Criteria	
Work safely	<p>To be competent, the user/individual on the job must be able to:</p> <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>PC6. ensure work area is clean and safe from hazards before and after the job is completed</p>	
Prepare for carrying out forging	<p>To be competent, the user/individual on the job must be able to:</p> <p>PC7. obtain job specification from a valid and approved source following due procedure</p> <p>Valid sources for job specifications are: job instruction sheet/ job card, work drawings and instructions, planning documentation, quality control documents, operation sheets, process specifications, instructions from supervisor</p> <p>PC8. read and establish job requirements from the job specification document accurately</p>	

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	<p>Job requirements to be established are: raw materials or components required (type, quality, quantity), dimensions and surface texture requirements, limits and tolerances, operations required (list, sequence and procedures where applicable) timelines</p> <p>PC9. report and rectify incorrect and inconsistent information in job specification documents as per organization procedures</p> <p>PC10. prepare the work area for the forging operations as per procedure</p> <p>PC11. ensure availability of prepared work-pieces /raw materials for forging as per job requirements</p> <p>PC12. ensure availability appropriate tools and equipment per job requirements</p> <p>PC13. set up machines and dies for carrying out forging</p>
Mark out	<p>To be competent, the user/individual on the job must be able to:</p> <p>PC14. measure and mark out specified features for plate bending and forming on the workpieces as per job specification using appropriate measuring and marking out tools and equipment</p> <p>PC15. trace/transfer the specified features from the templates onto the workpieces as per job specification</p>
Perform forging activity	<p>To be competent, the user/individual on the job must be able to:</p> <p>PC16. ensure that the material to be forged is safely and correctly positioned in the forming equipment as per specification</p> <p>PC17. maintain and control a solid fuel forge hearth safely to meet given objectives</p> <p>PC18. attach hammer tools and fixtures to power hammer correctly</p> <p>PC19. select and combine common forge work techniques to produce forged products and tools that are fit for purpose</p> <p>Techniques for forging are: hammer or drop forging, press forging, open-die forging, closed-die forging</p> <p>PC20. select heating plant and equipment as per the work undertaken</p> <p>PC21. set work pieces as per job requirements using appropriate positioning and/or holding devices</p> <p>PC22. apply techniques used to heat heavy and complex forgings correctly</p> <p>PC23. carry out common heat treatments of normalising and annealing on forged steel and minimise the effects of oxidation and overheating</p> <p>PC24. apply post-forging heating safely and as per organisational procedures</p> <p>PC25. deal with the hot forgings safely and as per organisational procedures</p> <p>PC26. prepare and use an inspection and maintenance checklist and report on the condition of a range of common forge equipment</p> <p>PC27. carry out the necessary repair/maintenance of forge hand tooling</p> <p>PC28. check forging to ensure conformance to tolerances and specifications to ensure completeness of work</p>

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	<p>PC29. identify common forging imperfections and correct errors</p> <p>PC30. keep finished components as well as raw material as per organizational procedure established</p> <p>PC31. produce components as per standards applicable to the process and in line with production targets</p> <p>PC32. report conditions and seek appropriate assistance in a timely manner to address risk of failure to comply with necessary targets and specifications</p> <p>PC33. deal with finished components as per organizational guidelines</p> <p>PC34. complete documentation during and post operations as per organizational procedures</p> <p>PC35. return all tools and equipment to the correct location on completion of the forging activities</p> <p>Common tools and equipment used are: hammers (hand hammer; sledge hammer; power hammer), tongs, punches, chisels, anvil, leg vice, swage block, floor mandrel, swages, swage blocks, jig setter, fly press set up, shafted tools, wired tools, shovel, blower, poker, fullers, flatters</p> <p>PC36. leave the work area in a safe and tidy condition on completion of job activities</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 safety precautions and activities to be taken while performing forging activities</p>

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	<p>Activities carried out during forging activities are: upsetting, drawing down, spreading, sets, transitions, swaging, fullering</p> <p>KB2. hazards associated with forging furnaces, equipment and processes and how to minimize the same</p> <p>KB3. importance of wearing the appropriate protective clothing and equipment</p> <p>KB4. kinds of common metals, metal alloys</p> <p>Kinds of materials on which preparation is done are: bronzes, steels (low-carbon, low alloy, high yield, stainless), aluminum/ aluminum alloys</p> <p>KB5. common terminology used in forging procedures</p> <p>KB6. kinds of tools & equipment for adjusting settings on machines</p> <p>KB7. forging methods and techniques and types of adjustment made to equipment settings to heat/prepare material for forging</p> <p>KB8. procedures, tools and techniques required to set operational performance parameters on machines</p> <p>KB9. importance of monitoring the equipment settings and function during theblasting process</p> <p>KB10. possible effects of heating and cooling on the structure of ferrous metals</p> <p>KB11. possible effects of oxidation/burning carburization, on ferrous metals</p> <p>KB12. possible effects of forging on the structure of ferrous metals</p> <p>KB13. correct techniques used to heat heavy and complex forgings</p> <p>KB14. common heat treatments of normalising and annealing on forged steel and minimising the effects of oxidation and overheating</p> <p>KB15. processes and tooling used to produce the finished forged products and hand tools</p> <p>KB16. methods of safe and efficient control and operation of the solid fuel forge hearth</p> <p>KB17. range of fuels and their properties of the solid fuel forge hearth</p> <p>KB18. reasons for selecting a specific machine, method or technique for forging operations</p> <p>KB19. suitability of work-pieces/materials and consumables for the specified job, its importance and procedures</p> <p>KB20. securing the work-piece/raw material correctly using appropriate devices and mechanisms</p> <p>KB21. methods and techniques to check for common forging imperfections/defects and conformance to specifications</p> <p>KB22. common problems that can occur in the forging procedure and forging imperfections /defects that can be removed</p> <p>KB23. procedures for handling components with forging imperfections/defects that cannot be removed/repared and how can they be minimized</p>
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	<p>KB24. importance of tools and equipment being kept in a safe and usable condition</p> <p>KB25. importance of shutting down the machine and keeping it in secure mode</p> <p>KB26. hazards associated with carrying out the forging process for metal working</p> <p>KB27. safe working practices and procedures to be observed when working with forging preparation tools</p> <p>Safe working practices in the forging activity are: tool set up, tong setting, jig setting, setting top and bottom tools, anvil height setting, press set up</p> <p>KB28. statutory requirements, risk assessment procedures and relevant requirements of health and safety at work regulations, the provision of and use of work equipment regulations, as applicable</p> <p>KB29. personal protective equipment (PPE) and clothing that must be worn during the forging activity and from where can it be obtained</p> <p>KB30. importance of completing the production documentation throughout the forging process</p> <p>KB31. what are the press types used in forging activities</p> <p>Press types: hydraulic presses, mechanical presses, screw presses, hammers (gravity drop; power drop; counter blow (two rams)), high pressure gas</p>
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 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. use appropriate measuring techniques
	SA4. use arithmetic to carry out basic calculations
	SA5. undertake numerical operations, and calculations/ formulae
	SA6. identify and draw various basic, compound and solid shapes as per dimensions given
	SA7. use appropriate measuring techniques and units of measurement
	SA8. use appropriate units and number systems to express degree of accuracy
	Oral Communication (Listening and Speaking skills)

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	<p>The user/individual on the job needs to know and understand how to:</p> <p>SA9. convey and share technical information clearly using appropriate language</p> <p>SA10. check and clarify task-related information</p> <p>SA11. liaise with appropriate authorities using correct protocol</p> <p>SA12. communicate with people in respectful form and manner in line with organizational protocol</p>
B. Professional Skills	Decision Making
	NA
	Plan and Organize
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB1. plan, prioritize and sequence work operations as per job requirements</p> <p>SB2. organize and analyze information relevant to work</p> <p>SB3. basic concepts of shop-floor work productivity including waste reduction, efficient material usage and optimization of time</p>
	Customer Centricity
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB4. exercise restraint while expressing dissent and during conflict situations</p> <p>SB5. avoid and manage distractions to be disciplined at work</p> <p>SB6. manage own time for achieving better results</p> <p>SB7. work in a team in order to achieve better results</p> <p>SB8. identify and clarify work roles within a team</p> <p>SB9. communicate and cooperate with others in the team for better results</p> <p>SB10. seek assistance from fellow team members</p>
	Problem Solving
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB11. identify problems with work planning, procedures, output and behavior and their implications</p> <p>SB12. prioritize and plan for problem solving</p> <p>SB13. communicate problems appropriately to others</p> <p>SB14. identify sources of information and support for problem solving</p> <p>SB15. seek assistance and support from other sources to solve problems</p> <p>SB16. identify effective resolution techniques</p> <p>SB17. select and apply resolution techniques</p> <p>SB18. seek evidence for problem resolution</p>
	Analytical Thinking
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB19. undertake and express new ideas and initiatives to others</p>

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	SB20. modify work plan to overcome unforeseen difficulties or developments that occur as work progresses
	SB21. participate in improvement procedures including process, quality and internal/external customer/supplier relationships
	SB22. enhance one's competencies in new and different situations and contexts to achieve more
	Critical Thinking
	The user/individual on the job needs to know and understand how to:
	SB23. participate in on-the-job and other learning, training and development interventions and assessments
	SB24. clarify task related information with appropriate personnel or technical adviser
	SB25. seek to improve and modify own work practices
	SB26. maintain current knowledge of application standards, legislation, codes of practice and product/process developments



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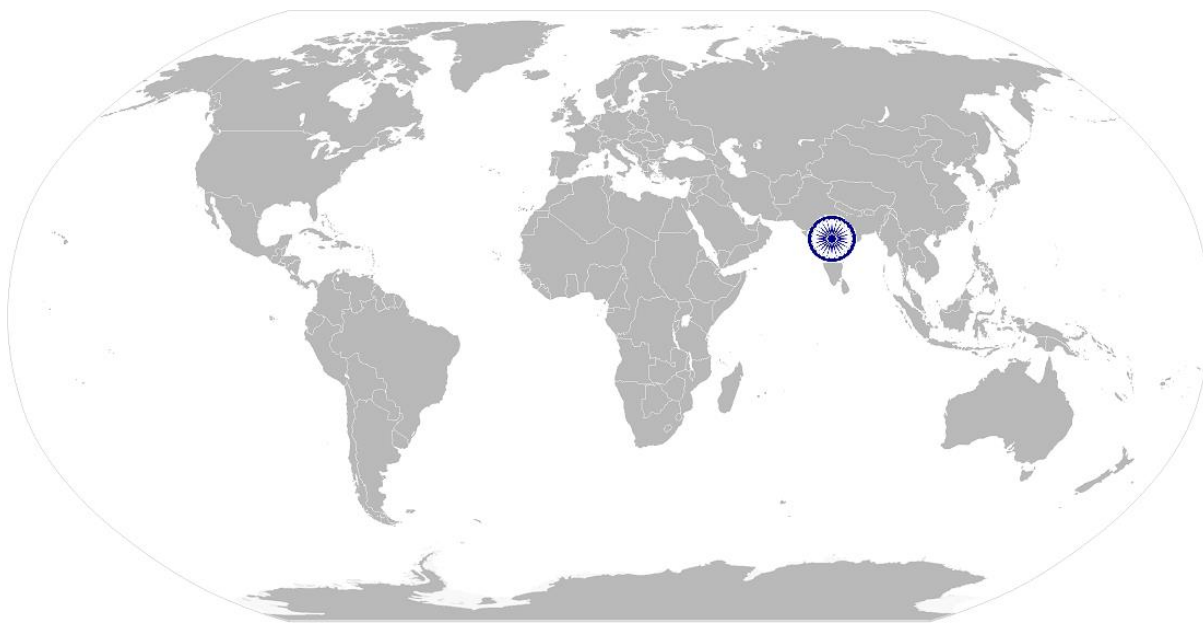
NOS Version Control

NOS Code	CSC/N1101		
Credits	TBD	Version number	1.0
Industry	Capital Goods	Drafted on	24/04/2014
Industry Sub-sector	Light Engineering Goods	Last reviewed on	24/11/2017
Occupation	Forging	Next review date	24/11/2021



CSC/N1001 Perform heat treatment operations on ferrous & non-ferrous metals and alloys using a variety of equipment

National Occupational Standard



Overview

This unit covers the competencies required for performing heat treatment operations on ferrous, non-ferrous metals and alloys using a variety of equipment.

CSC/N1001 Perform heat treatment operations on ferrous & non-ferrous metals and alloys using a variety of equipment

National Occupational Standard	Unit Code	CSC/N1001
	Unit Title (Task)	Perform heat treatment operations on ferrous & non-ferrous metals and alloys using a variety of equipment
	Description	This unit covers the competencies required for performing heat treatment operations on ferrous, non-ferrous metals and alloys using a variety of equipment. The applications for it would include cast metal products, machine tooling, forged and machined components. This involves preparing for the heat treatment activities by obtaining all the necessary job instructions, materials, tools and methods to suit work requirements.
	Scope	<p>This unit/task covers the following:</p> <ul style="list-style-type: none"> • Work safely • Prepare for performing heat treatment operations • Carry out heat treatment operations
	Performance Criteria(PC) w.r.t. the Scope	
	Element	Performance Criteria
	Work safely	<p>To be competent, the user/individual on the job must be able to:</p> <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 work area is clean and safe from hazards before and after the job is completed</p>
	Prepare for performing heat treatment operations	<p>To be competent, the user/individual on the job must be able to:</p> <p>PC6. prepare and maintain the work area as per procedure or operation specification</p> <p>PC7. obtain production and consumables materials required for performing heat treatment operations as per specifications from valid sources and job requirements</p> <p>Valid sources: job instructions; drawing instructions; material specifications; reference tables/charts; national, international and organizational standards; quality control documents; operation sheets; process specifications</p> <p>Job requirements: materials or components required; dimensions; tolerances; surface texture requirements; inspection requirements; operations required; sequence and procedures; shape or profiles</p>

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	<p>PC8. obtain various tools and equipment required for performing heat treatment operations as per specifications Equipment and tools: furnaces (gas, electric, oil fired, vacuum, hearth, pit type, muffle); induction heating; kilns; tempering ovens; heated baths; salt baths; gas torches; specialised tongs/tools and lifting equipment</p> <p>PC9. ensure that all measuring equipment are within calibration date and are approved for usage</p> <p>PC10. prepare the materials in readiness to receive the appropriate heat treatment Preparation activities: cleaning the surface (eg. removing scale, oil and dirt); degreasing; drying at the correct temperature; masking the materials to contain the case hardening or carburising deposits; polishing the material surface to be tempered using manual methods; packing or coating the components with a carbon enriched material; pre-heating before immersion into a salt bath; pickling; sand blasting; ascertain type of loading</p> <p>PC11. prepare the components, tools and equipment for the heat treatment activities as specified in the job specification documents Preparation activities: setting furnace or salt bath controls to give the correct temperature; the procedure for lighting and extinguishing the blacksmith's forge; setting up gas torches; ensuring that suitable tongs/handling/lifting devices are available Documents: detailed component drawings, approved sketches, illustrations, schematic diagrams, fabrication drawings, casting drawings</p> <p>PC12. check that the heat treatment equipment is at satisfactory operating Conditions</p>
<p>Carry out heat treatment operations</p>	<p>To be competent, the user/individual on the job must be able to:</p> <p>PC13. carry out various kinds of heat treatment processes eg. tempering heat treatment process, annealing heat treatment process, normalizing/stress relieving heat treatment process, carburising heat treatment process</p> <p>PC14. prepare furnace/forge or torch by lighting, using approved procedures</p> <p>PC15. cool the treated object using appropriate amounts of cooling medium so that it will not overheat or reach flash point</p> <p>PC16. ensure that components are loaded safely into the heat source/solution and are left for the required induction period</p> <p>PC17. remove the components safely and correctly from the heat source/solution</p> <p>PC18. carry out quenching/cooling of the components, using the appropriate medium and technique quenching/cooling media: fresh water, salt water, oil, air, sand, left in the furnace to cool</p> <p>PC19. inspect the final heat treated component to check if it is as per specification</p>

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	<p>and without defects</p> <p>PC20. deal promptly and effectively with problems within control, and seek help and guidance from the relevant people for problems that cannot be resolved</p> <p>PC21. shut down the heat treatment equipment to a safe condition on completion of the activities</p> <p>PC22. leave the work area in a safe and tidy condition on completion of the fitting activities</p> <p>PC23. refer unresolved job related problems to appropriate personnel for support</p> <p>PC24. monitor the problem and keep the supervisor informed about progress or any delays in resolving the problem</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. 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>
B. Technical Knowledge	<p>The user/individual on the job needs to know and understand:</p> <p>KB1. kinds of common metals, metal alloys and non-metals</p> <p>KB2. common terminology used in heat treatment procedures</p> <p>KB3. media to be used in heat treatment for different types of material Range of Materials: ferrous metals: eg. carbon steels, stainless steels, cast iron, tool steel, hard metals; non-ferrous metals: eg. bronze, bronze alloys, copper and copper alloys</p> <p>KB4. specific health and safety precautions which must be taken when carrying out heat treatment processes</p> <p>KB5. hazards associated with carrying out heat treatment processes and how they can be minimized Hazards: handling hot materials; using heat treatment solutions; fume inhalation; splashes from hot oil or liquids; working with fire and explosive</p>

CSC/N1001 Perform heat treatment operations on ferrous & non-ferrous metals and alloys using a variety of equipment

	<p>mixtures</p> <p>KB6. importance of ensuring that fume extraction equipment is operating effectively, and that good housekeeping and fire prevention procedures are observed</p> <p>KB7. importance of following job instructions and defined heat treatment procedures</p> <p>KB8. material preparation methods and techniques to be undertaken, prior to applying the heat treatments</p> <p>KB9. heat treatment processes to be carried out, and the types of application and metals for which they are best suited</p> <p>KB10. equipment used in heat treatment activities</p> <p>KB11. preparation of equipment for heat treatment activities</p> <p>KB12. methods used to hold/secure components in a heat treatment solution such as wires, hooks, jigs, etc.</p> <p>KB13. importance of monitoring equipment settings and process solutions during the heat treatment process</p> <p>KB14. correct temperature for heating of components as per the process being carried out and its importance</p> <p>KB15. quenching and cooling methods to be used</p> <p>KB16. need to maintain quenching oil at a temperature below its flash point</p> <p>KB17. problems that can occur with the heat treatment operations, and how these can be overcome</p> <p>KB18. procedures for handling components with imperfections/defects that cannot be removed/repared and how can they be minimized</p> <p>KB19. importance of leaving the work area and equipment in a safe and clean condition on completion of the heat treatment activities</p> <p>KB20. importance of reporting problems in a timely manner</p> <p>KB21. methods and parameters to check quality of the shaped components against required quality standards</p> <p>KB22. consumable related to heat treatment procedures</p> <p>KB23. calibration schedule of all equipment used in heat treatment procedure</p> <p>KB24. record keeping of the heat treatment job including data logging, chart recording of various activities and data points like tolerance levels, etc.</p> <p>KB25. importance of tools and equipment to be kept in a safe and usable condition</p> <p>KB26. personal protective equipment (PPE) and clothing that must be worn during the heat treatment activity and from where can it be obtained</p>
Skills (S)	
	Reading Skills

CSC/N1001 Perform heat treatment operations on ferrous & non-ferrous metals and alloys using a variety of equipment

A. Core Skills/ Generic 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 basic numerical operations, and calculations/ formulae SA4. identify various basic, compound and solid shapes as per dimensions given SA5. use appropriate measuring techniques and units of measurement SA6. use appropriate units and number systems to express degree of accuracy SA7. use metric systems of measurement
	Oral Communication (Listening and Speaking skills)
	The user/individual on the job needs to know and understand how to: SA8. convey and share technical information clearly using appropriate language SA9. check and clarify task-related information SA10. liaise with appropriate authorities using correct protocol SA11. communicate with people in respectful form and manner in line with organizational protocol
B. Professional Skills	Decision Making
	NA
	Plan and Organize
	The user/individual on the job needs to know and understand how to: SB1. plan, prioritize and sequence work operations as per job requirements SB2. organize and analyze information relevant to work SB3. basic concepts of shop-floor work productivity including waste reduction, efficient material usage and optimization of time
	Customer Centricity
	The user/individual on the job needs to know and understand how to: SB4. exercise restraint while expressing dissent and during conflict situations SB5. avoid and manage distractions to be disciplined at work SB6. manage own time for achieving better results SB7. work in a team in order to achieve better results SB8. identify and clarify work roles within a team SB9. communicate and cooperate with others in the team for better results SB10. seek assistance from fellow team members

CSC/N1001 Perform heat treatment operations on ferrous & non-ferrous metals and alloys using a variety of equipment

	Problem Solving
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB11. identify problems with work planning, procedures, output and behavior and their implications</p> <p>SB12. prioritize and plan for problem solving</p> <p>SB13. communicate problems appropriately to others</p> <p>SB14. identify sources of information and support for problem solving</p> <p>SB15. seek assistance and support from other sources to solve problems</p> <p>SB16. identify effective resolution techniques</p> <p>SB17. select and apply resolution techniques</p> <p>SB18. seek evidence for problem resolution</p>
	Analytical Thinking
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB19. undertake and express new ideas and initiatives to others</p> <p>SB20. modify work plan to overcome unforeseen difficulties or developments that occur as work progresses</p> <p>SB21. participate in improvement procedures including process, quality and internal/external customer/supplier relationships</p> <p>SB22. enhance one's competencies in new and different situations and contexts to achieve more</p>
	Critical Thinking
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB23. participate in on-the-job and other learning, training and development interventions and assessments</p> <p>SB24. clarify task related information with appropriate personnel or technical adviser</p> <p>SB25. seek to improve and modify own work practices</p> <p>SB26. maintain current knowledge of application standards, legislation, codes of practice and product/process developments</p>

CSC/N1001 Perform heat treatment operations on ferrous & non-ferrous metals and alloys using a variety of equipment

NOS Version Control

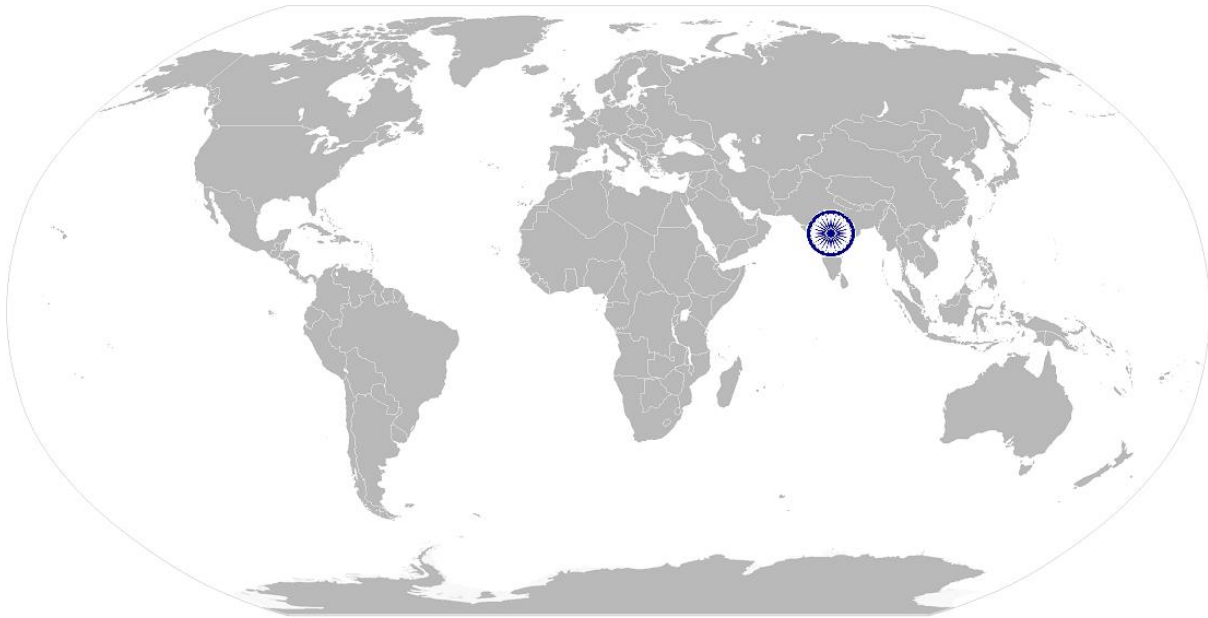
NOS Code	CSC/N1001		
Credits	TBD	Version number	1.0
Industry	Capital Goods	Drafted on	24/04/2014
Industry Sub-sector	Light Engineering Goods	Last reviewed on	24/11/2017
Occupation	Forging	Next review date	24/11/2021



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. It includes understanding of risks and hazards in the workplace, along with common techniques to minimize risk, deal with accidents, emergencies, etc.
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 procedure
Performance Criteria(PC) w.r.t. the Scope	
Element	Performance Criteria
Health and safety	<p>To be competent, the user/individual on the job must be able to:</p> <p>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</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 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</p>

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Use basic health and safety practices at the workplace

	<p>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 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 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 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 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.</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 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 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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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	<p>To be competent, the user/individual on the job must 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>
Emergencies, rescue and first-aid procedures	<p>To be competent, the user/individual on the job must 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>

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

	PC27. demonstrate correct method to move injured people and others during an emergency
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. 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>
B. Technical Knowledge	<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</p>

CSC/N1335

Use basic health and safety practices at the workplace

	<p>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> <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)	
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

CSC/N1335

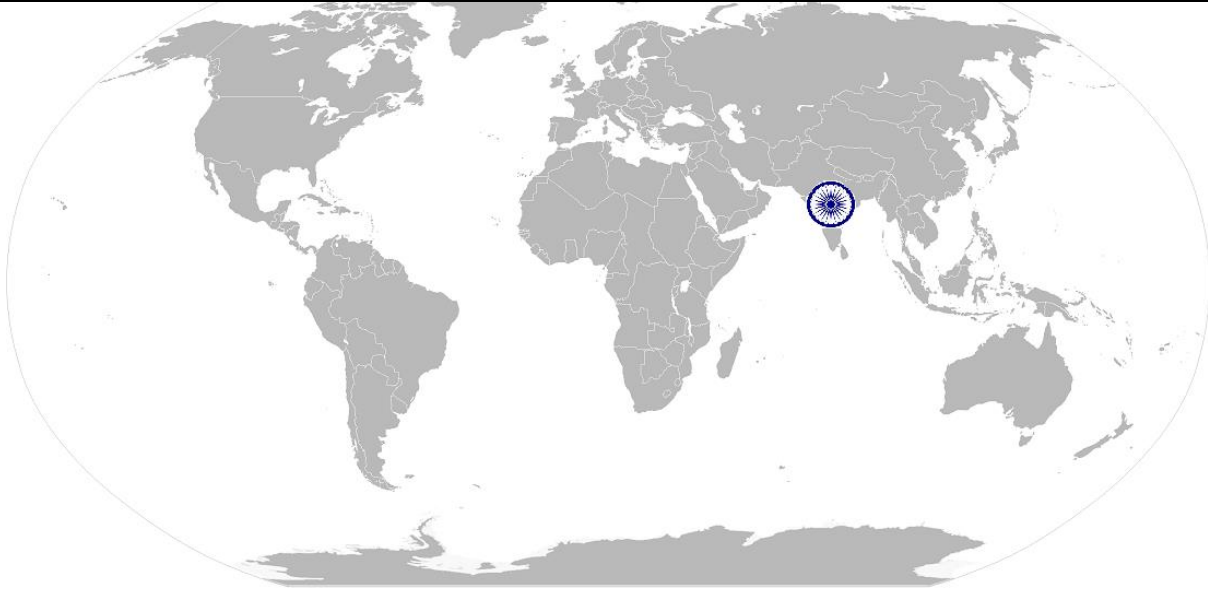
Use basic health and safety practices at the workplace

	materials to maintain decorum and for improved productivity
	Customer Centricity
	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

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

NOS Version Control

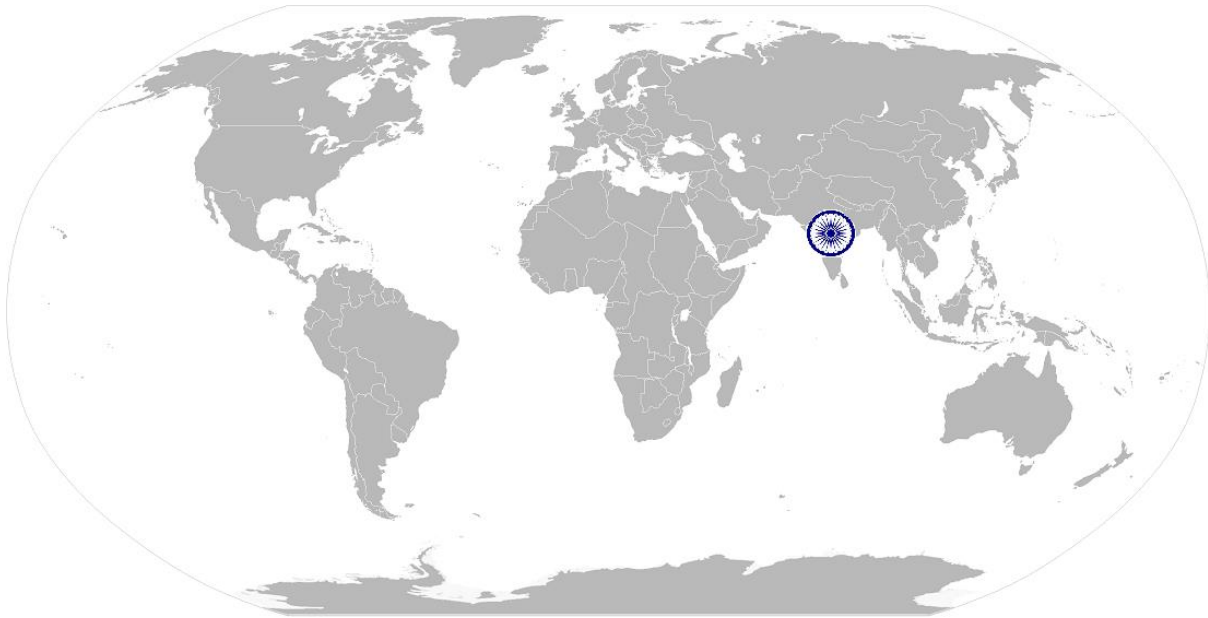
NOS Code	CSC/N1335		
Credits	TBD	Version number	1.0
Industry	Capital Goods	Drafted on	24/04/2014
Industry Sub-sector	Light Engineering Goods	Last reviewed on	24/11/2017
Occupation	Forging	Next review date	24/11/2021



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: <ul style="list-style-type: none"> Work effectively with others
Performance Criteria(PC) w.r.t. the Scope	
Element	Performance Criteria
Work effectively with others	<p>To be competent, the user/individual on the job must be able to:</p> <p>PC1. receive information accurately and instructions from the supervisor and fellow workers, getting clarification where required</p> <p>PC2. pass information accurately 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 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 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 /	<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</p>

CSC/N1336

Work effectively with others

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

CSC/N1336

Work effectively with others

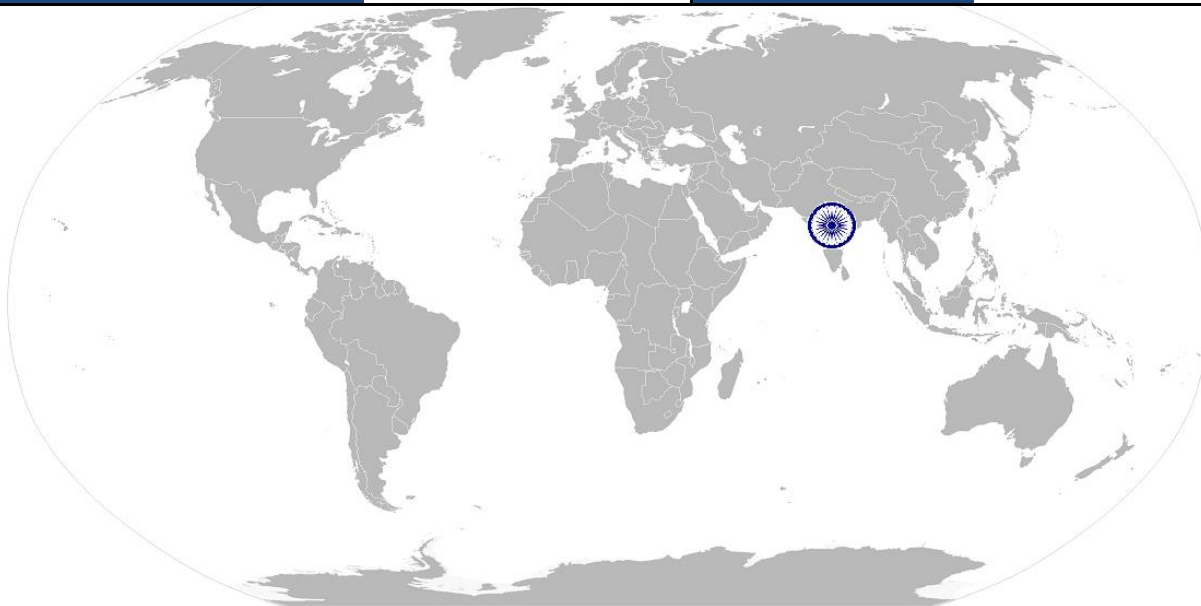
B. Professional Skills	Oral Communication (Listening and Speaking skills)
	The user/individual on the job needs to know and understand how to:
	SA5. interact with the supervisor appropriately (correct protocol and manner of speaking) in order to understand the basic requirements of the product, production 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
	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	24/04/2014
Industry Sub-sector	Light Engineering Goods	Last reviewed on	24/11/2017
Occupation	Forging	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)

[Back to top...](#)

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

Criteria For Assessment Of Trainees

Job Role: Forger

Qualification Pack: CSC/Q1101

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				Marks Allocation	
Total Marks: 400					
Assessment outcomes	Assessment Criteria for outcomes	Total Marks	Out of	Theory	Skills Practical
CSC/N1101 Perform forging techniques on ferrous & non-ferrous metals and alloys for metalworking	PC1.comply with health and safety, environmental and other relevant regulations and guidelines at work and ensure process compliance	100	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		3	1	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		2	0	2
	PC5.ensure that all measuring equipment are within calibration date and are approved for usage		2	0	2

PC6.ensure work area is clean and safe from hazards before and after the job is completed	2	0	2
PC7.obtain job specification from a valid and approved source following due procedure	2	0	2
PC8.read and establish job requirements from the job specification document accurately	3	1	2
PC9.report and rectify incorrect and inconsistent information in job specification documents as per organization procedures	3	1	2
PC10.prepare the work area for the forging operations as per procedure	2	0	2
PC11.ensure availability of prepared work-pieces /raw materials for forging as per job requirements	3	1	2
PC12.ensure availability appropriate tools and equipment per job requirements	2	0	2
PC13.set up machines and dies for carrying out forging	2	0	2
PC14.measure and mark out specified features for plate bending and forming on the workpieces as per job specification using appropriate measuring and marking out tools and equipment	3	1	2
PC15.trace/transfer the specified features from the templates onto the workpieces as per job specification	3	1	2
PC16.ensure that the material to be forged is safely and correctly positioned in the forming equipment as per specification	3	1	2
PC17.maintain and control a solid fuel forge hearth safely to meet given objectives	4	2	2
PC18.attach hammer tools and fixtures to power hammer correctly	2	0	2
PC19.select and combine common forge work techniques to produce forged products and tools that are fit for purpose	2	0	2
PC20.select heating plant and equipment as per the work undertaken	2	0	2
PC21.set work pieces as per job requirements using appropriate positioning and/or holding devices	4	1	3
PC22.apply techniques used to heat heavy and complex forgings correctly	3	0	3

	PC23.carry out common heat treatments of normalising and annealing on forged steel and minimise the effects of oxidation and overheating		4	0	4
	PC24.apply post-forging heating safely and as per organisational procedures		5	1	4
	PC25.deal with the hot forgings safely and as per organisational procedures		3	1	2
	PC26.prepare and use an inspection and maintenance checklist and report on the condition of a range of common forge equipment		2	0	2
	PC27.carry out the necessary repair/maintenance of forge hand tooling		2	0	2
	PC28.check forging to ensure conformance to tolerances and specifications to ensure completeness of work		5	2	3
	PC29.identify common forging imperfections and correct errors		2	0	2
	PC30.keep finished components as well as raw material as per organizational procedure established		3	1	2
	PC31.produce components as per standards applicable to the process and in line with production targets		3	1	2
	PC32.report conditions and seek appropriate assistance in a timely manner to address risk of failure to comply with necessary targets and specifications		2	0	2
	PC33.deal with finished components as per organizational guidelines		3	1	2
	PC34.complete documentation during and post operations as per organizational procedures		3	1	2
	PC35.return all tools and equipment to the correct location on completion of the forging activities		2	0	2
	PC36.leave the work area in a safe and tidy condition on completion of job activities		2	0	2
		Total	100	20	80
CSC/N1001 Perform heat treatment operations on ferrous & non-	PC1.comply with health and safety, environmental and other relevant regulations and guidelines at work and ensure process compliance	100	4	1	3

ferrous metals and alloys using a variety of equipment	PC2.adhere to procedures or systems in place for risk assessment, occupational standards, personal protective equipment (PPE) and other relevant occupational safety regulations		5	1	4
	PC3.work following laid down procedures and instructions		4	1	3
	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 work area is clean and safe from hazards before and after the job is completed		3	0	3
	PC6.prepare and maintain the work area as per procedure or operation specification		6	2	4
	PC7.obtain production and consumables materials required for performing heat treatment operations as per specifications from valid sources and job requirements		4	1	3
	PC8.obtain various tools and equipment required for performing heat treatment operations as per specifications		4	1	3
	PC9.ensure that all measuring equipment are within calibration date and are approved for usage		3	0	3
	PC10.prepare the materials in readiness to receive the appropriate heat treatment		4	0	4
	PC11.prepare the components, tools and equipment for the heat treatment activities as specified in the job specification documents		6	2	4
	PC12.check that the heat treatment equipment is at satisfactory operating Conditions		4	0	4
	PC13.carry out various kinds of heat treatment processes eg. tempering heat treatment process, annealing heat treatment process, normalizing/stress relieving heat treatment process, carburising heat treatment process		8	3	5
	PC14.prepare furnace/forging or torch by lighting, using approved procedures		7	3	4
	PC15.cool the treated object using appropriate amounts of cooling medium so that it will not overheat or reach flash point		5	0	5
	PC16.ensure that components are loaded safely into the heat source/solution and are left for the required induction period		3	0	3

	PC17.remove the components safely and correctly from the heat source/solution		3	0	3
	PC18.carry out quenching/cooling of the components, using the appropriate medium and technique quenching/cooling media:fresh water, salt water, oil, air, sand, left in the furnace to cool		4	0	4
	PC19.inspect the final heat treated component to check if it is as per specification and without defects		5	2	3
	PC20.deal promptly and effectively with problems within control, and seek help and guidance from the relevant people for problems that cannot be resolved		3	0	3
	PC21.shut down the heat treatment equipment to a safe condition on completion of the activities		3	0	3
	PC22.leave the work area in a safe and tidy condition on completion of the fitting activities		3	0	3
	PC23.refer unresolved job related problems to appropriate personnel for support		3	0	3
	PC24.monitor the problem and keep the supervisor informed about progress or any delays in resolving the problem		3	0	3
		Total	100	17	83
CSC/N1335 Use basic health and safety practices at the workplace	PC1.use protective clothing/equipment for specific tasks and work conditions	100	4	1	3
	PC2.state the name and location of people responsible for health and safety in the workplace		3	1	2
	PC3.state the names and location of documents that refer to health and safety in the workplace		3	1	2
	PC4.identify job-site hazardous work and state possible causes of risk or accident in the workplace		5	2	3
	PC5.carry out safe working practices while dealing with hazards to ensure the safety of self and others		4	2	2
	PC6.state methods of accident prevention in the work environment of the job role		3	2	1
	PC7.state location of general health and safety equipment in the workplace		5	2	3
	PC8.inspect for faults, set up and safely use steps and ladders in general use		5	2	3
	PC9.work safely in and around trenches, elevated places and confined areas		5	2	3

PC10.lift heavy objects safely using correct procedures	4	2	2
PC11.apply good housekeeping practices at all times	5	2	3
PC12.identify common hazard signs displayed in various areas	3	1	2
PC13.retrieve and/or point out documents that refer to health and safety in the workplace	4	1	3
PC14.use the various appropriate fire extinguishers on different types of fires correctly	3	1	2
PC15.demonstrate rescue techniques applied during fire hazard	3	1	2
PC16.demonstrate good housekeeping in order to prevent fire hazards	4	1	3
PC17.demonstrate the correct use of a fire extinguisher	4	1	3
PC18.demonstrate how to free a person from electrocution	4	1	3
PC19.administer appropriate first aid to victims where required eg. in case of bleeding, burns, choking, electric shock, poisoning etc.	3	1	2
PC20.demonstrate basic techniques of bandaging	3	1	2
PC21.respond promptly and appropriately to an accident situation or medical emergency in real or simulated environments	3	1	2
PC22.perform and organize loss minimization or rescue activity during an accident in real or simulated environments	3	1	2
PC23.administer first aid to victims in case of a heart attack or cardiac arrest due to electric shock, before the arrival of emergency services in real or simulated cases	3	1	2
PC24.demonstrate the artificial respiration and the CPR Process	3	1	2
PC25.participate in emergency procedures	4	1	3
PC26.complete a written accident/incident report or dictate a report to another person, and send report to person responsible	3	1	2
PC27.demonstrate correct method to move injured people and others during an emergency	4	2	2
Total	100	36	64

CSC/N1336 Work effectively with others	PC1.receive information accurately and instructions from the supervisor and fellow workers, getting clarification where required	100	10	3	7
	PC2.pass information accurately to authorized persons who require it and within agreed timescale and confirm its receipt		10	3	7
	PC3.give information to others clearly, at a pace and in a manner that helps them to understand		10	3	7
	PC4.display helpful behavior by assisting others in performing tasks in a positive manner, where required and possible		10	3	7
	PC5.consult with and assist others to maximize effectiveness and efficiency in carrying out tasks		10	3	7
	PC6.display appropriate communication etiquette while working		10	3	7
	PC7.display active listening skills while interacting with others at work		10	3	7
	PC8.use appropriate tone, pitch and language to convey politeness, assertiveness, care and professionalism		10	3	7
	PC9.demonstrate responsible and disciplined behaviors at the workplace		10	3	7
	PC10.escalate grievances and problems to appropriate authority as per procedure to resolve them and avoid conflict		10	3	7
	Total		100	30	70