QUALIFICATIONS PACK - OCCUPATIONAL STANDARDS FOR CAPITAL GOODS INDUSTRY

Contents

1. Introduction and Contacts.....1
2. Qualifications Pack.....2
3. Glossary of Key Terms.....4
4. OS Units.....6
5. Annexure:Nomenclature for QP and OS...35
6. Assessment Criteria.....37

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

Contact Us:
Capital Goods Skill Council, FICCI,
Federation House,
Tansen Marg,
New Delhi 110 001

E-mail:
inder.gahlaut@ficci.com

Introduction

Qualifications Pack: Forger

SECTOR: CAPITAL GOODS

SUB-SECTOR:

1. Light Engineering Goods

OCCUPATION: Forging

REFERENCE ID: CSC/ Q 1101

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

Forger: 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.

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, basic 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 1101**		
Job Role	**Forger**		
Credits (NSQF)	**TBD**	**Version number**	**1.0**
Sector	**CAPITAL GOODS**	**Drafted on**	**10/04/14**
Sub-sector	1. Light Engineering Goods	**Last reviewed on**	**18/03/15**
Occupation	**FORGING**	**Next review date**	**30/08/16**
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*	10th 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)	**Compulsory:** 1. CSC/ N 1101 (Perform forging techniques on ferrous & non-ferrous metals and alloys for metalworking) 2. CSC/ N 1001 (Perform heat treatment operations on ferrous & non-ferrous metals and alloys using a variety of equipment) 3. CSC/ N 1335 (Use basic health and safety practices at the workplace) 4. CSC/ N 1336 (Work effectively with others) **Optional:** N.A.
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.

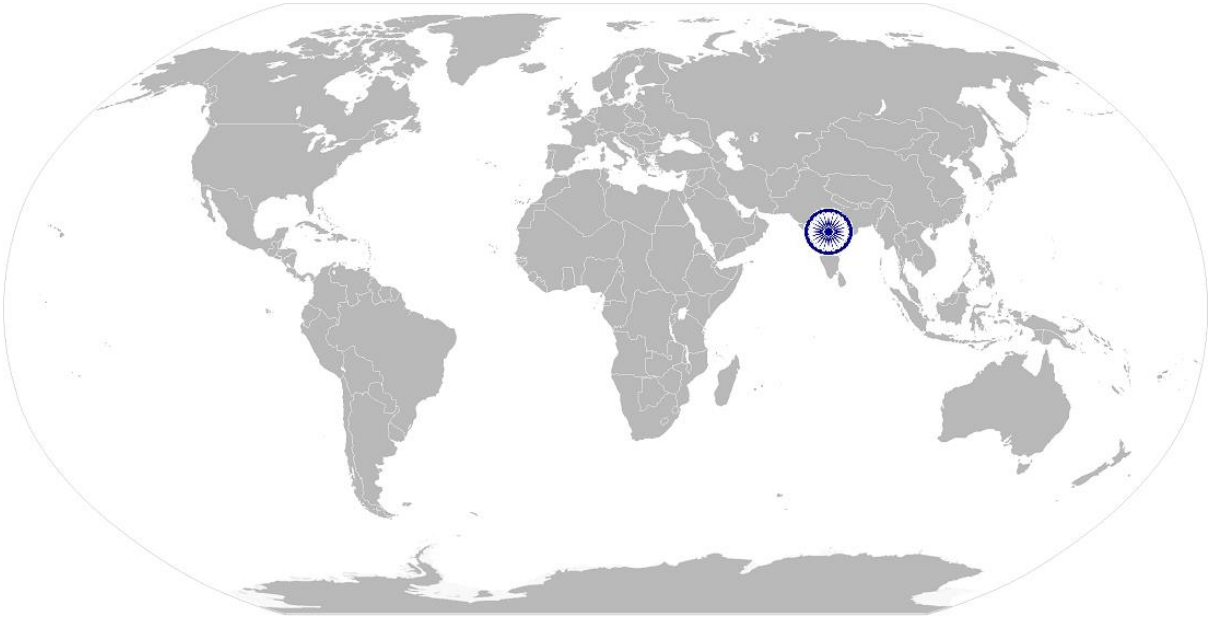
Acronyms

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

CSC/ N 1101: 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/ N 1101: Perform forging techniques on ferrous & non-ferrous metals and alloys for metal working

National Occupational Standard

Unit Code	**CSC/ N 1101**
Unit Title (Task)	**Perform forging techniques on ferrous & non-ferrous metals and alloys 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 involves understanding the preparation procedures, 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) for forging. It also involves inspecting the components after forging and correcting faults to ensure that the output is as per the required specification. The candidate will be expected to extract all necessary information in order to carry out the operations from the specifications, select the appropriate equipment based on the type and complexity of the preparation to be carried out. The candidate will also be expected to perform under minimum supervision, take responsibility for own actions and for the quality and accuracy of the work produced. The candidate will have knowledge and understanding of the equipment, materials and consumables used; various kinds of equipment and machines used in forging with their applications, and procedures; the importance of quality and accuracy in the work and the safety precautions required. The candidate will be required to demonstrate safe working practices throughout, and will understand responsibility they owe to themselves and others in the workplace.
Scope	This unit/task covers the following: 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 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

CSC/ N 1101: Perform forging techniques on ferrous & non-ferrous metals and alloys for metal working

Kinds of materials on which preparation is done are:

- bronzes
- steels (low-carbon, low alloy, high yield, stainless)
- aluminum/aluminum alloys

Techniques for forging are:

- hammer or drop forging
- press forging
- open-die forging
- closed-die forging

Activities carried out during forging activities are:

- upsetting
- drawing down
- spreading
- sets
- transitions
- swaging
- fullering

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

Press types used are:

- hydraulic presses
- mechanical presses
- screw presses
- hammers
  - gravity drop
  - power drop
  - counter blow (two rams)
  - high pressure gas

Common tools and equipment used are:

- hammers
  - hand hammer
  - sledge hammer
  - power hammer
- tongs
- punches
- chisels

CSC/ N 1101: Perform forging techniques on ferrous & non-ferrous metals and alloys for metal working

	• 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
Performance Criteria(PC) w.r.t. the Scope	
Element	**Performance Criteria**
Working safely	The user/individual on the job should be able to: PC1. comply with health and safety, environmental and other relevant regulations and guidelines at work and ensure process compliance PC2. adhere to procedures or systems in place for risk assessment, occupational standards, personal protective equipment (PPE) and other relevant occupational safety regulations PC3. work following laid down procedures and instructions PC4. ensure that all tools, equipment, power tool cables, extension leads are in a safe and usable condition and are kept at secured location PC5. ensure that all measuring equipment are within calibration date and are approved for usage PC6. ensure work area is clean and safe from hazards before and after the job is completed
Preparing for carrying out forging	The user/individual on the job should be able to: PC7. obtain job specification from a valid and approved source following due procedure PC8. read and establish job requirements from the job specification document accurately PC9. report and rectify incorrect and inconsistent information in job specification documents as per organization procedures PC10. prepare the work area for the forging operations as per procedure PC11. ensure availability of prepared work-pieces /raw materials for forging as per job requirements PC12. ensure availability appropriate tools and equipment per job requirements PC13. set up machines and dies for carrying out forging
Marking out	The user/individual on the job should be able to: PC14. measure and mark out specified features for plate bending and forming on the workpieces as per job specification using appropriate measuring and

CSC/ N 1101: Perform forging techniques on ferrous & non-ferrous metals and alloys for metal working

	marking out tools and equipment PC15. trace/transfer the specified features from the templates onto the workpieces as per job specification
Performing forging activity	The user/individual on the job should be able to: PC16. ensure that the material to be forged is safely and correctly positioned in the forming equipment as per specification PC17. maintain and control a solid fuel forge hearth safely to meet given objectives PC18. attach hammer tools and fixtures to power hammer correctly PC19. select and combine common forge work techniques to produce forged products and tools that are fit for purpose PC20. select heating plant and equipment as per the work undertaken PC21. set work pieces as per job requirements using appropriate positioning and/or holding devices PC22. apply techniques used to heat heavy and complex forgings correctly PC23. carry out common heat treatments of normalising and annealing on forged steel and minimise the effects of oxidation and overheating PC24. apply post-forging heating safely and as per organisational procedures PC25. deal with the hot forgings safely and as per organisational procedures PC26. prepare and use an inspection and maintenance checklist and report on the condition of a range of common forge equipment PC27. carry out the necessary repair/maintenance of forge hand tooling PC28. check forging to ensure conformance to tolerances and specifications to ensure completeness of work PC29. identify common forging imperfections and correct errors PC30. keep finished components as well as raw material as per organizational procedure established PC31. produce components as per standards applicable to the process and in line with production targets PC32. report conditions and seek appropriate assistance in a timely manner to address risk of failure to comply with necessary targets and specifications PC33. deal with finished components as per organizational guidelines PC34. complete documentation during and post operations as per organizational procedures PC35. return all tools and equipment to the correct location on completion of the forging activities PC36. leave the work area in a safe and tidy condition on completion of job activities
Knowledge and Understanding (K)	
A. Organizational Context (Knowledge of the company / organization and its processes)	The user/individual on the job needs to know and understand: KA1. relevant legislation, standards, policies, and procedures followed in the company relevant to own employment and performance conditions KA2. relevant health and safety requirements applicable in the work place KA3. own job role and responsibilities and sources for information pertaining to employment terms, entitlements, job role and responsibilities KA4. reporting structure, inter-dependent functions, lines and procedures in the work area KA5. how to engage with specialists for support in order to resolve incidents and

CSC/ N 1101: Perform forging techniques on ferrous & non-ferrous metals and alloys for metal working

	service requests KA6. importance of working in clean and safe environment practices and procedures KA7. relevant people and their responsibilities within the work area KA8. escalation matrix and procedures for reporting work and employment related issues KA9. documentation and related procedures applicable in the context of employment and work
B. Technical Knowledge	The user/individual on the job needs to know and understand: KB1. specific safety precautions to be taken while performing forging activities KB2. hazards associated with forging furnaces, equipment and processes and how to minimize the same KB3. importance of wearing the appropriate protective clothing and equipment KB4. kinds of common metals, metal alloys KB5. common terminology used in forging procedures KB6. kinds of tools & equipment for adjusting settings on machines KB7. forging methods and techniques and types of adjustment made to equipment settings to heat/prepare material for forging KB8. procedures, tools and techniques required to set operational performance parameters on machines KB9. importance of monitoring the equipment settings and function during the blasting process KB10. possible effects of heating and cooling on the structure of ferrous metals KB11. possible effects of oxidation/burning, carburization, on ferrous metals KB12. possible effects of forging on the structure of ferrous metals KB13. correct techniques used to heat heavy and complex forgings KB14. common heat treatments of normalising and annealing on forged steel and minimising the effects of oxidation and overheating KB15. processes and tooling used to produce the finished forged products and hand tools KB16. methods of safe and efficient control and operation of the solid fuel forge hearth KB17. range of fuels and their properties of the solid fuel forge hearth KB18. reasons for selecting a specific machine, method or technique for forging operations KB19. suitability of work-pieces/materials and consumables for the specified job, its importance and procedures KB20. securing the work-piece/raw material correctly using appropriate devices and mechanisms KB21. methods and techniques to check for common forging imperfections/defects and conformance to specifications KB22. common problems that can occur in the forging procedure and forging imperfections /defects that can be removed KB23. procedures for handling components with forging imperfections/defects that cannot be removed/repaired and how can they be minimized KB24. importance of tools and equipment being kept in a safe and usable condition KB25. importance of shutting down the machine and keeping it in secure mode

CSC/ N 1101: Perform forging techniques on ferrous & non-ferrous metals and alloys for metal working

	KB26. hazards associated with carrying out the forging process for metal working KB27. safe working practices and procedures to be observed when working with forging preparation tools 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 KB29. personal protective equipment (PPE) and clothing that must be worn during the forging activity and from where can it be obtained KB30. importance of completing the production documentation throughout the forging process
Skills (S) [Optional]	
B. Core Skills/ Generic Skills	**Communication**
	The user/ individual on the job needs to know and understand how to: 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 SA2. fill up appropriate technical forms, process charts, activity logs as per organizational format in English and/or local language 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
	Learning
	The user/individual on the job needs to know and understand how to: SA7. maintain current knowledge of applicable standards, legislation, codes of practice and product/process developments SA8. participate in on-the-job and other learning, training and development interventions and assessment SA9. clarify task related information with appropriate personnel or technical adviser SA10. seek to improve and modify own work practices
A. Professional Skills	**Problem Solving**
	The user/individual on the job needs to know and understand how to: SB1. identify problems with work planning, procedures, output and behavior and their implications SB2. prioritize and plan for problem solving SB3. communicate problems appropriately to others SB4. identify sources of information and support for problem solving SB5. seek assistance and support from other sources to solve problems SB6. identify effective resolution techniques SB7. select and apply resolution techniques SB8. seek evidence for problem resolution

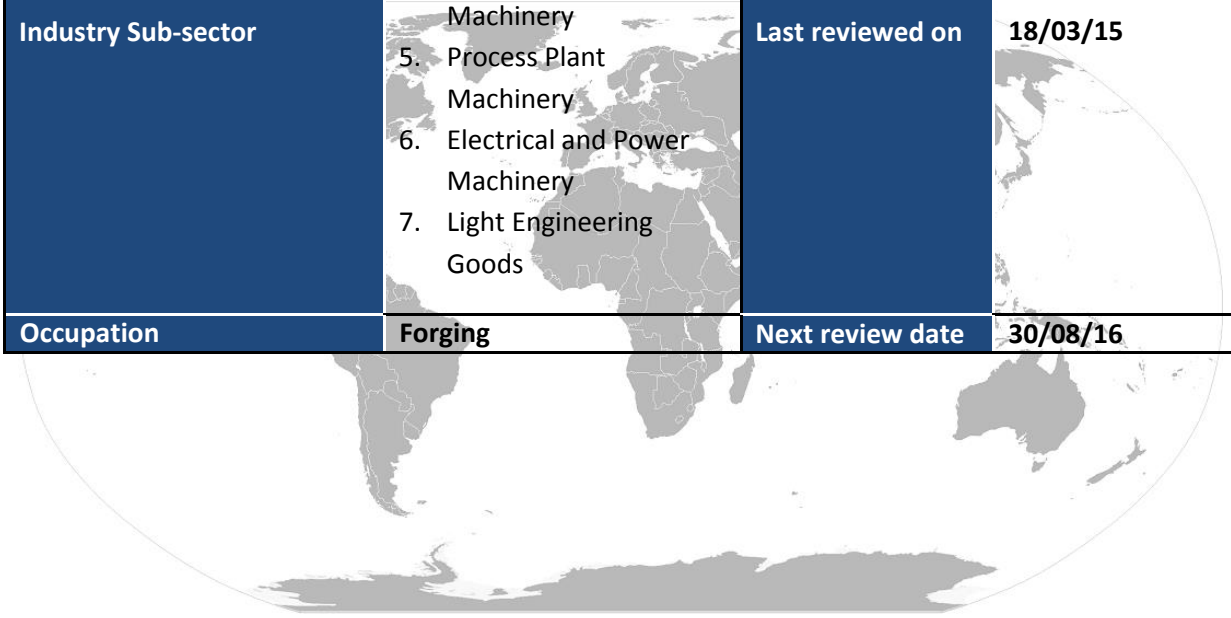
CSC/ N 1101: Perform forging techniques on ferrous & non-ferrous metals and alloys for metal working

	Plan and Organize
	The user/individual on the job needs to know and understand how to: 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
	Numerical and computation skills
	The user/individual on the job needs to know and understand how to: SB12. use appropriate measuring techniques SB13. use arithmetic to carry out basic calculations SB14. undertake numerical operations, and calculations/ formulae SB15. identify and draw various basic, compound and solid shapes as per dimensions given SB16. use appropriate measuring techniques and units of measurement SB17. use appropriate units and number systems to express degree of accuracy
	Initiative and Enterprise
	The user/individual on the job needs to know and understand: SB18. importance and impact of initiative and enterprise for achieving better results for self, others and organization SB19. how to undertake and express new ideas and initiatives to others SB20. modify work plan to overcome unforeseen difficulties or developments that occur as work progresses SB21. participate in improvement procedures including process, quality and internal/external customer/supplier relationships SB22. one's competencies can and should be applied in new and different situations and contexts to achieve more
	Self Management
	The user/individual on the job needs to know and understand: SB23. importance of taking responsibility for own work outcomes SB24. importance of adherence to work timings, dress code and other organizational policies SB25. importance of following laid down rules, procedures, instructions and policies SB26. importance of exercising restraint while expressing dissent and during conflict situations SB27. how to avoid and manage distractions to be disciplined at work SB28. importance of time management for achieving better results
	Teamwork
	The user/individual on the job needs to know and understand how to: SB29. work in a team in order to achieve better results SB30. identify and clarify work roles within a team SB31. communicate and cooperate with others in the team SB32. seek assistance from fellow team members

CSC/ N 1101: Perform forging techniques on ferrous & non-ferrous metals and alloys for metal working

NOS Version Control

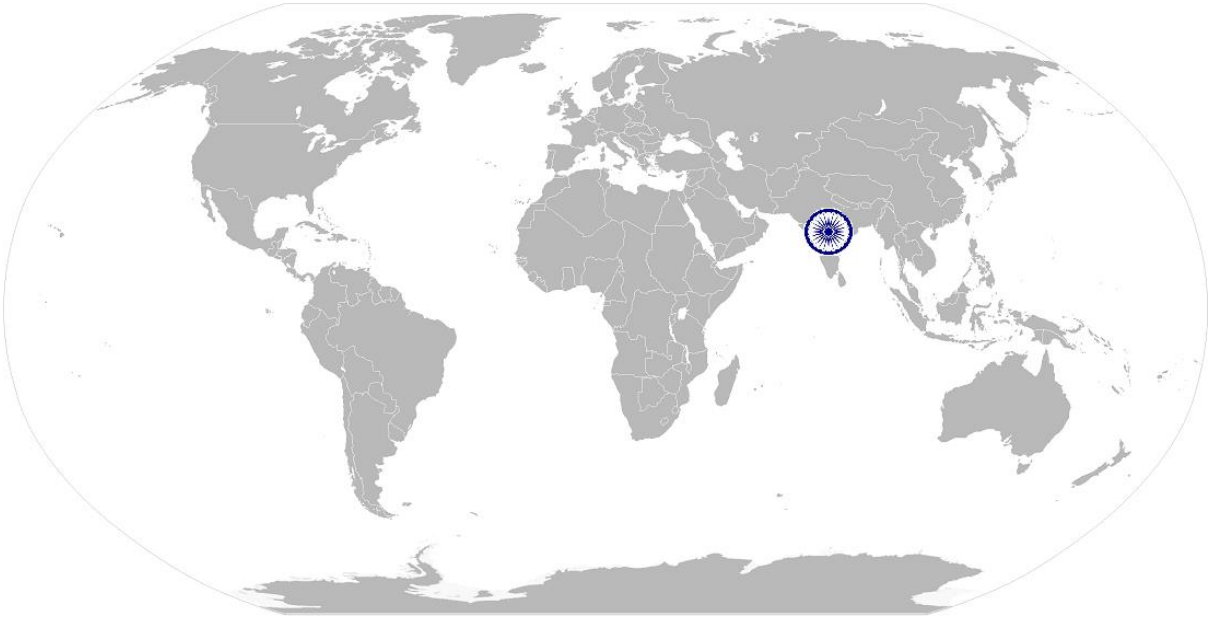
NOS Code	CSC/ N 1101		
Credits (NSQF)	TBD	Version number	1.0
Industry	Capital Goods	Drafted on	10/04/14
Industry Sub-sector	1. Machine Tools 2. Tools Dies And Press Tools 3. Plastic Manufacturing Machinery 4. Textile Manufacturing Machinery 5. Process Plant Machinery 6. Electrical and Power Machinery 7. Light Engineering Goods	Last reviewed on	18/03/15
Occupation	Forging	Next review date	30/08/16



CSC/ N 1001: 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/ N 1001: Perform heat treatment operations on ferrous & non-ferrous metals and alloys using a variety of equipment

National Occupational Standard

Unit Code	CSC/ N 1001
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, and 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; preparing the tools and equipment, applying heat treatment procedures, identifying imperfections, using measuring equipment, understanding processing hazards and finally carrying out heat treatment on the material with appropriate tools and process to match specifications. The heat treatment activities include the application of treatments such as lame hardening, case hardening, induction hardening, carburizing, tempering, annealing, normalizing and stress relieving, as applicable. It also involves inspecting the components after heat treatment operations and correcting faults to ensure that the job is completed as per the required specification. The candidate will be expected to perform as per instructions given, take responsibility for own actions and for the quality and accuracy of the work produced. The candidate will have knowledge and understanding the preparation and heat treatment techniques used, and their application, the equipment, materials and consumables, heat treatment operations and procedures; the importance of quality and accuracy in the work and the safety precautions required. The candidate will be required to demonstrate safe working practices throughout, and will understand responsibility they owe to themselves and others in the workplace.
Scope	• Working safely • Preparing for performing heat treatment operations • Carrying out heat treatment operations

Performance Criteria(PC) w.r.t. the Scope	
Element	**Performance Criteria**
Working safely	The user / individual on the job should be able to: PC1. comply with health and safety, environmental and other relevant regulations and guidelines at work and ensure process compliance PC2. adhere to procedures or systems in place for risk assessment, occupational standards, personal protective equipment (PPE) and other relevant occupational safety regulations PC3. work following laid down procedures and instructions PC4. ensure that all tools, equipment, power tool cables, extension leads are in a safe and usable condition and are kept at secured location

CSC/ N 1001: Perform heat treatment operations on ferrous & non-ferrous metals and alloys using a variety of equipment

	PC5. ensure work area is clean and safe from hazards before and after the job is completed
Preparing for performing heat treatment operations	PC6. prepare and maintain the work area as per procedure or operation specification PC7. obtain production and consumables materials required for performing heat treatment operations as per specifications from valid sources and job requirements **Valid sources**: job instructions; drawing instructions; material specifications; reference tables/charts; national, international and organizational standards; quality control documents; operation sheets; process specifications **Job requirements**: materials or components required; dimensions; tolerances; surface texture requirements; inspection requirements; operations required; sequence and procedures; shape or profiles 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 PC9. ensure that all measuring equipment are within calibration date and are approved for usage 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 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 PC12. check that the heat treatment equipment is at satisfactory operating conditions

CSC/ N 1001: Perform heat treatment operations on ferrous & non-ferrous metals and alloys using a variety of equipment

Carrying out heat treatment operations	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 PC14. prepare furnace/forge or torch by lighting, using approved procedures PC15. cool the treated object using appropriate amounts of cooling medium so that it will not overheat or reach flash point PC16. ensure that components are loaded safely into the heat source/solution and are left for the required induction period PC17. remove the components safely and correctly from the heat source/solution 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 PC19. inspect the final heat treated component to check if it is as per specification and without defects PC20. deal promptly and effectively with problems within control, and seek help and guidance from the relevant people for problems that cannot be resolved PC21. shut down the heat treatment equipment to a safe condition on completion of the activities PC22. leave the work area in a safe and tidy condition on completion of the fitting activities PC23. refer unresolved job related problems to appropriate personnel for support PC24. monitor the problem and keep the supervisor informed about progress or any delays in resolving the problem
Knowledge and Understanding (K)	
A. Organizational Context (Knowledge of the company / organization and its processes)	The user/individual on the job needs to know and understand: KA1. relevant legislation, standards, policies, and procedures followed in the company relevant to own employment and performance conditions KA2. relevant health and safety requirements applicable in the work place KA3. own job role and responsibilities and sources for information pertaining to employment terms, entitlements, job role and responsibilities KA4. reporting structure, inter-dependent functions, lines and procedures in the work area KA5. how to engage with specialists for support in order to resolve incidents and service requests KA6. importance of working in clean and safe environment practices and procedures KA7. relevant people and their responsibilities within the work area KA8. escalation matrix and procedures for reporting work and employment related issues
B. Technical Knowledge	The user/individual on the job needs to know and understand: KB1. kinds of common metals, metal alloys and non-metals KB2. common terminology used in heat treatment procedures KB3. media to be used in heat treatment for different types of material

CSC/ N 1001: Perform heat treatment operations on ferrous & non-ferrous metals and alloys using a variety of equipment

	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 KB4. specific health and safety precautions which must be taken when carrying out heat treatment processes 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 mixtures KB6. importance of ensuring that fume extraction equipment is operating effectively, and that good housekeeping and fire prevention procedures are observed KB7. importance of following job instructions and defined heat treatment procedures KB8. material preparation methods and techniques to be undertaken, prior to applying the heat treatments KB9. heat treatment processes to be carried out, and the types of application and metals for which they are best suited KB10. Equipment used in heat treatment activities KB11. preparation of equipment for heat treatment activities KB12. methods used to hold/secure components in a heat treatment solution such as wires, hooks, jigs, etc. KB13. importance of monitoring equipment settings and process solutions during the heat treatment process KB14. correct temperature for heating of components as per the process being carried out and its importance KB15. quenching and cooling methods to be used KB16. need to maintain quenching oil at a temperature below its flash point KB17. problems that can occur with the heat treatment operations, and how these can be overcome KB18. procedures for handling components with imperfections/defects that cannot be removed/repaired and how can they be minimized KB19. importance of leaving the work area and equipment in a safe and clean condition on completion of the heat treatment activities KB20. importance of reporting problems in a timely manner KB21. methods and parameters to check quality of the shaped components against required quality standards KB22. consumable related to heat treatment procedures KB23. calibration schedule of all equipment used in heat treatment procedure KB24. record keeping of the heat treatment job including data logging, chart recording of various activities and data points like tolerance levels, etc. KB25. importance of tools and equipment to be kept in a safe and usable condition KB26. personal protective equipment (PPE) and clothing that must be worn during the heat treatment activity and from where can it be obtained
Skills (S) [Optional]	
A. Core Skills/	**Communication**

CSC/ N 1001: Perform heat treatment operations on ferrous & non-ferrous metals and alloys using a variety of equipment

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, manuals, health and safety instructions, memos, etc. applicable to the job in English and/or local language SA2. fill up appropriate technical forms, process charts, activity logs as per organizational format in English and/or local language 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
	Numerical and computational skills
	The user/individual on the job needs to know and understand how to: SA7. undertake basic numerical operations, and calculations/ formulae SA8. identify various basic, compound and solid shapes as per dimensions given SA9. use appropriate measuring techniques and units of measurement SA10. use appropriate units and number systems to express degree of accuracy SA11. use metric systems of measurement
	Learning
	The user/individual on the job needs to know and understand how to: SA12. participate in on-the-job and other learning, training and development interventions and assessment SA13. clarify task related information with appropriate personnel or technical adviser SA14. seek to improve and modify own work practices
B. Professional Skills	**Problem Solving**
	The user/individual on the job needs to know and understand how to: SB1. identify problems with work, procedures, output and behavior and their implications SB2. communicate problems appropriately to others SB3. identify sources of information and support for problem solving SB4. seek assistance and support from other sources to solve problems SB5. identify effective resolution techniques SB6. select and apply resolution techniques SB7. seek evidence for problem resolution
	Plan and Organize
	The user/individual on the job needs to know and understand how to: SB8. plan, prioritize and sequence work operations as per job requirements SB9. use basic concepts of shop-floor work productivity including waste reduction, energy savings, efficient material usage and optimization of time
	Initiative and Enterprise
	The user/individual on the job needs to know and understand: SB10. one's competencies can and should be applied in new and different situations and contexts to achieve more

CSC/ N 1001: Perform heat treatment operations on ferrous & non-ferrous metals and alloys using a variety of equipment

	SB11. how to express new ideas and initiatives to others SB12. participate in improvement procedures including process, quality and internal/external customer/supplier relationships
	Self-Management
	The user/individual on the job needs to know and understand: SB13. importance of taking responsibility for own work outcomes SB14. importance of adherence to work timings, dress code and other organizational policies SB15. importance of following laid down rules, procedures, instructions and policies SB16. importance of exercising restraint while expressing dissent and during conflict situations SB17. how to avoid and manage distractions to be disciplined at work SB18. importance of time management for achieving better results
	Teamwork
	The user/individual on the job needs to know and understand how to: 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 SB22. seek assistance from fellow team members

CSC/ N 1001: Perform heat treatment operations on ferrous & non-ferrous metals and alloys using a variety of equipment

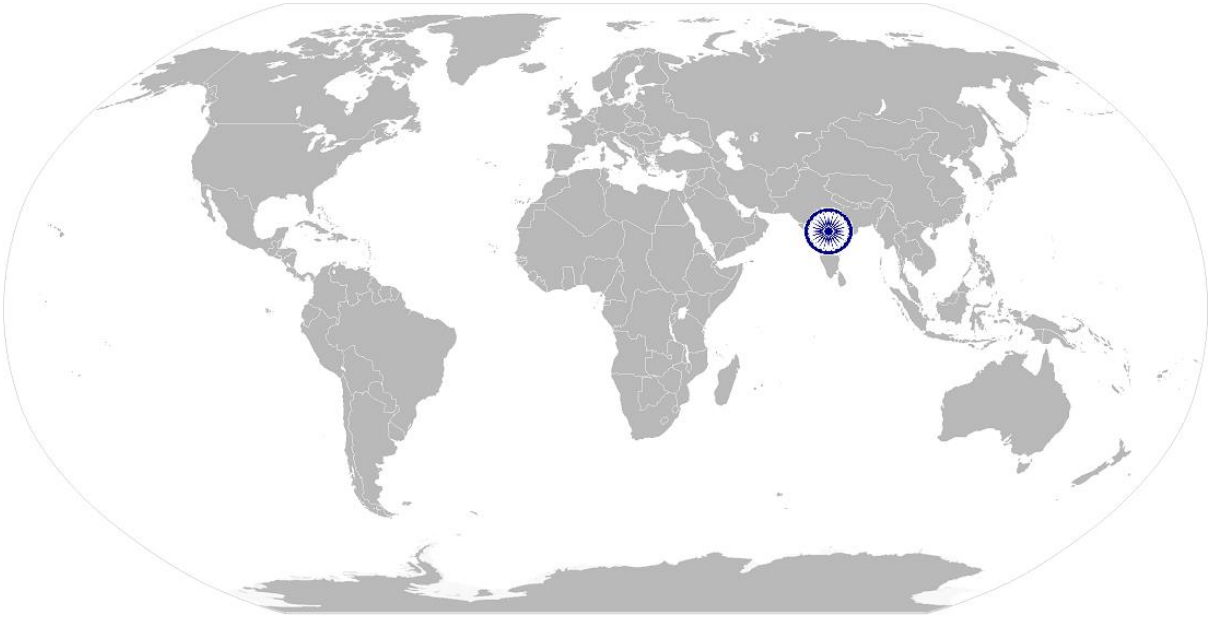
NOS Version Control

NOS Code	CSC/ N 1001		
Credits (NSQF)	TBD	Version number	1.0
Industry	Capital Goods	Drafted on	10/04/14
Industry Sub-sector	1. Machine Tools 2. Dies, Moulds And Press Tools 3. Plastics Manufacturing Machinery 4. Textile Manufacturing Machinery 5. Process Plant Machinery 6. Electrical and Power Machinery 7. Light Engineering Goods	Last reviewed on	18/03/15
Occupation	Forging	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	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. It covers knowledge of fire safety, common first aid applications, safe practices and emergency procedures.
Scope	This unit/task covers the following: • 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	The user/individual on the job should be able to: PC1. use protective clothing/equipment for specific tasks and work conditions **Protective clothing**: leather or asbestos gloves, flame proof aprons, flame proof overalls buttoned to neck, cuffless (without folds), trousers, reinforced footwear, helmets/hard hats, cap and shoulder covers, ear defenders/plugs, safety boots, knee pads, particle masks, glasses/goggles/visors **Equipment**: hand shields, machine guards, residual current devices, shields, dust sheets, respirator PC2. state the name and location of people responsible for health and safety in the workplace PC3. state the names and location of documents that refer to health and safety in the workplace PC4. identify job-site hazardous work and state possible causes of risk or accident in the workplace **Hazards**: sharp edged and heavy tools; heated metals; oxyfuel and gas cylinders; welding radiation; hazardous surfaces(sharp, slippery, uneven, chipped, broken, etc.); hazardous substances(chemicals, gas, oxy-fuel, fumes, dust, etc.); physical hazards(working at heights, large and heavy objects and machines, sharp and piercing objects, tolls and machines, intense light, load noise, obstructions in corridors, by doors, blind turns, noise, over stacked shelves and packages, etc.) electrical hazards (power supply and points, loose and naked cables and wires, electrical machines and appliances, etc.)

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

	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) PC5. carry out safe working practices while dealing with hazards to ensure the safety of self and others **Safe working practices**: using protective clothing and equipment; putting up and reading safety signs; handle tools in the correct manner and store and maintain them properly; keep work area clear of clutter, spillage and unsafe object lying casually; while working with electricity take all electrical precautions like insulated clothing, adequate equipment insulation, use of control equipment, dry work area, switch off the power supply when not required, etc.; safe lifting and carrying practices; use equipment that is working properly and is well maintained; take due measures for safety while working in confined places, trenches or at heights, etc. including safety harness, fall arrestors, etc. PC6. state methods of accident prevention in the work environment of the job role **Methods of accident prevention**: training in health and safety procedures; using health and safety procedures; use of equipment and working practices (such as safe carrying procedures); safety notices, advice; instruction from colleagues and supervisors PC7. state location of general health and safety equipment in the workplace **General health and safety equipment**: fire extinguishers; first aid equipment; safety instruments and clothing; safety installations(eg fire exits, exhaust fans) PC8. inspect for faults, set up and safely use steps and ladders in general use **Ladder faults**: corrosion of metal components, deterioration, splits and cracks timber components, imbalance, loose rungs, missing/ unfixed nuts or bolts, etc. **Ladders set up**: firm/level base, clip/lash down, leaning at the correct angle, etc. PC9. work safely in and around trenches, elevated places and confined areas PC10. lift heavy objects safely using correct procedures PC11. apply good housekeeping practices at all times **Good housekeeping practices**: clean/tidy work areas, removal/disposal of waste products, protect surfaces PC12. identify common hazard signs displayed in various areas **Various areas**: on chemical containers; equipment; packages; inside buildings; in open areas and public spaces, etc. PC13. retrieve and/or point out documents that refer to health and safety in the workplace

CSC/ N 1335: 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	The user/individual on the job should be able to: PC14. use the various appropriate fire extinguishers on different types of fires correctly **Types of fires**: Class A: eg. ordinary solid combustibles, such as wood, paper, cloth, plastic, charcoal, etc.; Class B: flammable liquids and gases, such as gasoline, propane, diesel fuel, tar, cooking oil, and similar substances; Class C: eg. electrical equipment such as appliances, wiring, breaker panels, etc. (These categories of fires become Class A, B, and D fires when the electrical equipment that initiated the fire is no longer receiving electricity); Class D: combustible metals such as magnesium, titanium, and sodium (These fires burn at extremely high temperatures and require special suppression agents) PC15. demonstrate rescue techniques applied during fire hazard PC16. demonstrate good housekeeping in order to prevent fire hazards PC17. demonstrate the correct use of a fire extinguisher
Emergencies, rescue and first-aid procedures	The user/individual on the job should be able to: PC18. demonstrate how to free a person from electrocution PC19. administer appropriate first aid to victims where required eg. in case of bleeding, burns, choking, electric shock, poisoning etc. PC20. demonstrate basic techniques of bandaging PC21. respond promptly and appropriately to an accident situation or medical emergency in real or simulated environments PC22. perform and organize loss minimization or rescue activity during an accident in real or simulated environments PC23. administer first aid to victims in case of a heart attack or cardiac arrest due to electric shock, before the arrival of emergency services in real or simulated cases PC24. demonstrate the artificial respiration and the CPR Process PC25. participate in emergency procedures **Emergency procedures**: raising alarm, safe/efficient, evacuation, correct means of escape, correct assembly point, roll call, correct return to work PC26. complete a written accident/incident report or dictate a report to another person, and send report to person responsible **Incident Report includes details of**: name, date/time of incident, date/time of report, location, environment conditions, persons involved, sequence of events, injuries sustained, damage sustained, actions taken, witnesses, supervisor/manager notified PC27. demonstrate correct method to move injured people and others during an emergency
Knowledge and Understanding (K)	

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

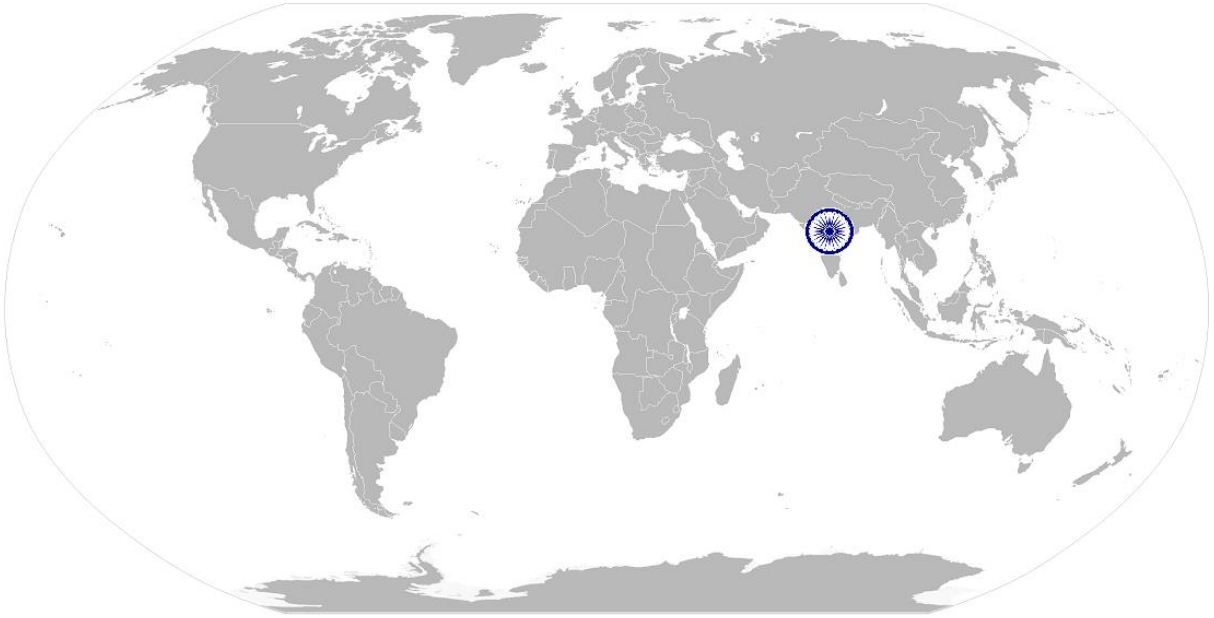
A. Organizational Context (Knowledge of the company / organization and its processes)	The user/individual on the job needs to know and understand: KA1. names (and job titles if applicable), and where to find, all the people responsible for health and safety in a workplace. KA2. names and location of documents that refer to health and safety in the workplace.
B. Technical Knowledge	The user/individual on the job needs to know and understand: KB1. meaning of "hazards" and "risks" KB2. health and safety hazards commonly present in the work environment and related precautions KB3. possible causes of risk, hazard or accident in the workplace and why risk and/or accidents are possible KB4. possible causes of risk and accident **Possible causes of risk and accident**: physical actions; reading; listening to and giving instructions; inattention; sickness and incapacity (such as drunkenness); health hazards (such as untreated injuries and contagious illness) KB5. methods of accident prevention **Methods of accident prevention**: training in health and safety procedures; using health and safety procedures; use of equipment and working practices (such as safe carrying procedures); safety notices, advice; instruction from colleagues and supervisors KB6. safe working practices when working with tools and machines KB7. safe working practices while working at various hazardous sites KB8. where to find all the general health and safety equipment in the workplace KB9. various dangers associated with the use of electrical equipment KB10. preventative and remedial actions to be taken in the case of exposure to toxic materials **Exposure:** ingested, contact with skin, inhaled **Preventative action**: ventilation, masks, protective clothing/ equipment); **Remedial action:** immediate first aid, report to supervisor **Toxic materials:** solvents, flux, lead KB11. importance of using protective clothing/equipment while working KB12. precautionary activities to prevent the fire accident KB13. various causes of fire **Causes of fires**: heating of metal; spontaneous ignition; sparking; electrical heating; loose fires (smoking, welding, etc.); chemical fires; etc. KB14. techniques of using the different fire extinguishers KB15. different methods of extinguishing fire KB16. different materials used for extinguishing fire **Materials**: sand, water, foam, CO2, dry powder KB17. rescue techniques applied during a fire hazard KB18. various types of safety signs and what they mean

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

	KB19. appropriate basic first aid treatment relevant to the condition eg. shock, electrical shock, bleeding, breaks to bones, minor burns, resuscitation, poisoning, eye injuries KB20. content of written accident report KB21. potential injuries and ill health associated with incorrect manual handing KB22. safe lifting and carrying practices KB23. personal safety, health and dignity issues relating to the movement of a person by others KB24. potential impact to a person who is moved incorrectly
Skills (S) [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: 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 worksmanship and authority
	Problem Solving

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

	The user/individual on the job needs to know and understand how to: 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
	The user/individual on the job needs to know and understand how to: SB12. identify cause and effect relations in their area of work SB13. use cause and effect relations to anticipate potential problems and their solution



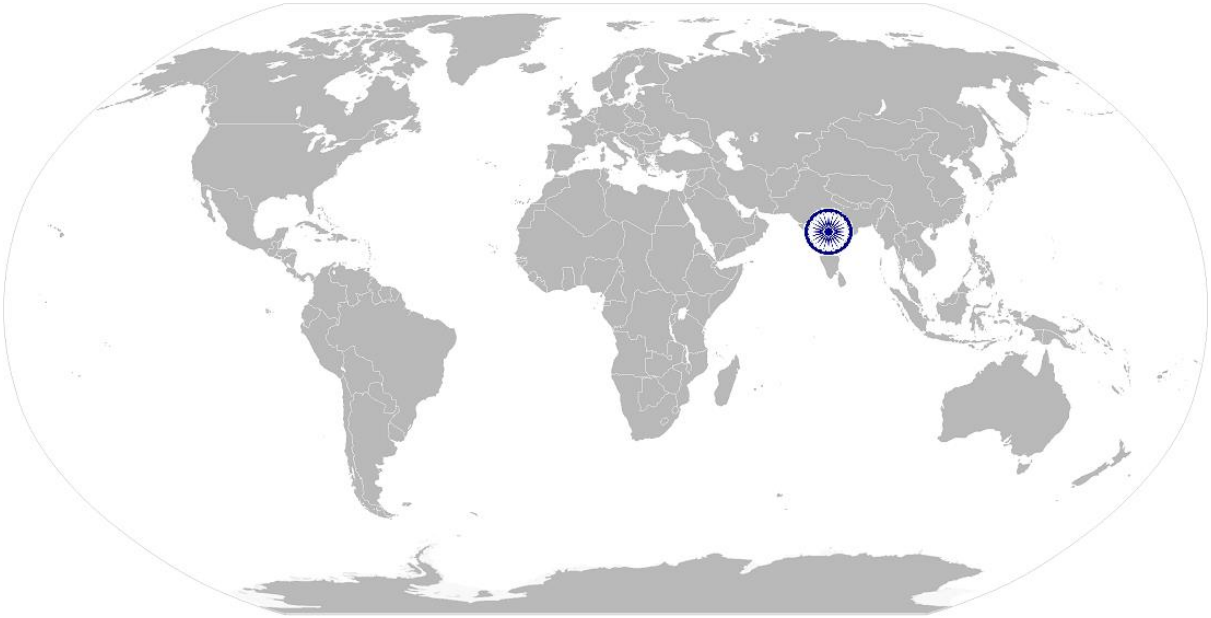
CSC/ N 1335: Use basic health and safety practices at the workplace

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	1. Machine Tools 2. Tools Dies 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	**Forging**	**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.

National Occupational Standard

CSC/ N 1336: Work effectively with others

Unit Code	**CSC / N 1336**
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, handling conflict and grievances.
Scope	This unit/task covers the following: • Working with others

Performance Criteria (PC) w.r.t. the Scope	
Element	**Performance Criteria**
Working with others	The user/individual on the job should be able to: PC1. accurately receive information and instructions from the supervisor and fellow workers, getting clarification where required PC2. accurately pass on information to authorized persons who require it and within agreed timescale and confirm its receipt PC3. give information to others clearly, at a pace and in a manner that helps them to understand PC4. display helpful behavior by assisting others in performing tasks in a positive manner, where required and possible PC5. consult with and assist others to maximize effectiveness and efficiency in carrying out tasks PC6. display appropriate communication etiquette while working **Communication etiquette:** do not use abusive language; use appropriate titles and terms of respect; do not eat or chew while talking (vice versa)etc. PC7. display active listening skills while interacting with others at work PC8. use appropriate tone, pitch and language to convey politeness, assertiveness, care and professionalism PC9. demonstrate responsible and disciplined behaviors at the workplace **Disciplined behaviors:** e.g. punctuality; completing tasks as per given time and standards; not gossiping and idling time; eliminating waste, honesty, etc. PC10. escalate grievances and problems to appropriate authority as per procedure to resolve them and avoid conflict

Knowledge and Understanding (K)	
A. Organizational Context (Knowledge of the company / organization and its processes)	The user/individual on the job needs to know and understand: KA1. legislation, standards, policies, and procedures followed in the company relevant to own employment and performance conditions KA2. reporting structure, inter-dependent functions, lines and procedures in the work area KA3. relevant people and their responsibilities within the work area KA4. escalation matrix and procedures for reporting work and employment related issues

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	1. Machine Tools 2. Tools Dies 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	Forging	Next review date	30/08/16

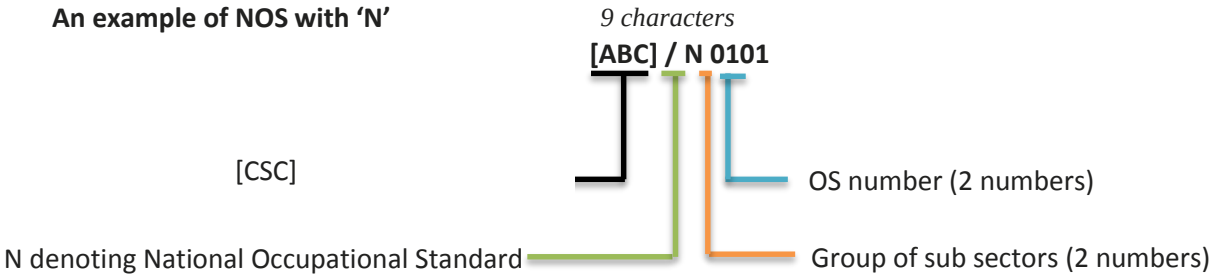
Annexure

Nomenclature for QP and NOS

Qualifications Pack

Occupational Standard

An example of NOS with 'N'



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

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

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

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

CRITERIA FOR ASSESSMENT OF TRAINEES

Job Role : Forger

Qualification Pack : CSC/ Q 1101

Sector Skill Council : Capital Goods sector 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. Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training center (as per assessment criteria below)
4. Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/training center based on this criteria
5. To pass the Qualification Pack , every trainee should score a minimum of 70% in every NOS
6. In case of successfully passing only certain number of NOS's, the trainee is eligible to take subsequent assessment on the balance NOS's to pass the Qualification Pack.

Assessable Outcomes	Assessment Criteria	Total Marks (300)	Out Of	Theory	Skills Practical
CSC/ N 1101: 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 work pieces 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 work pieces 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 normalizing and annealing on forged steel and minimize the effects of oxidation and overheating		4	0	4

	PC24. apply post-forging heating safely and as per organizational procedures		5	1	4
	PC25. deal with the hot forgings safely and as per organizational 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/ N 1001: Perform heat treatment operations on ferrous & non-ferrous metals and alloys using a variety of equipment	PC1. comply with health and safety, environmental and other relevant regulations and guidelines at work and ensure process compliance	**100**	4	1	3
	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, carburizing heat treatment process		8	3	5
	PC14. prepare furnace/forge 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		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/ 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**