

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



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 & OS.....	32
6. Assessment Criteria.....	34

Introduction

Qualifications Pack- CNC Operator - Turning

SECTOR/S: CAPITAL GOODS

SUB-SECTOR:

- | | |
|-------------------------------------|-----------------------------------|
| 1. Machine Tools | 5. Process Plant Machinery |
| 2. Dies, Moulds and Press Tools | 6. Electrical and Power Machinery |
| 3. Plastics Manufacturing Machinery | 7. Light Engineering Goods |
| 4. Textile Manufacturing Machinery | |

OCCUPATION: Machining

REFERENCE ID: CSC/Q0115

ALIGNED TO: NCO-2004/NIL

Brief Job Description: It involves removal of metal from the outer diameter of a rotating cylindrical workpiece. It also involves inspecting the components and continuously monitoring of the machining operations and making minor adjustments in order to ensure that the work output is to the required quality and accuracy.

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



Job Details	Qualifications Pack Code	CSC/Q0115		
	Job Role	CNC Operator - Turning [Applicable for National Scenarios]		
	Credits	TBD	Version number	1.0
	Sector	Capital Goods	Drafted on	10/04/2014
	Sub-sector	<ol style="list-style-type: none"> 1. Machine Tools 2. Dies, Moulds and Press Tools 3. Plastics Manufacturing Machinery 4. Textile Manufacturing Machinery 5. Process Plant Machinery 6. Electrical and Power Machinery 7. Light Engineering Goods 	Last reviewed on	24/11/2017
	Occupation	Machining	Next review date	24/11/2021
	NSQC Clearance on	19/05/2015		

Job Role	CNC Operator - Turning
Role Description	Operation of Computer Numerically Controlled (CNC) machines, such as CNC lathe machine, in order to perform turning operations on metal components, as per specifications provided.
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)	<p>Compulsory:</p> <ol style="list-style-type: none"> CSC/N0115 Perform turning operations on metal components using Computer Numerically Controlled (CNC) machines CSC/N1335 Use basic health and safety practices at the workplace CSC/N1336 Work effectively with others
Performance Criteria	As described in the relevant OS units

Definitions

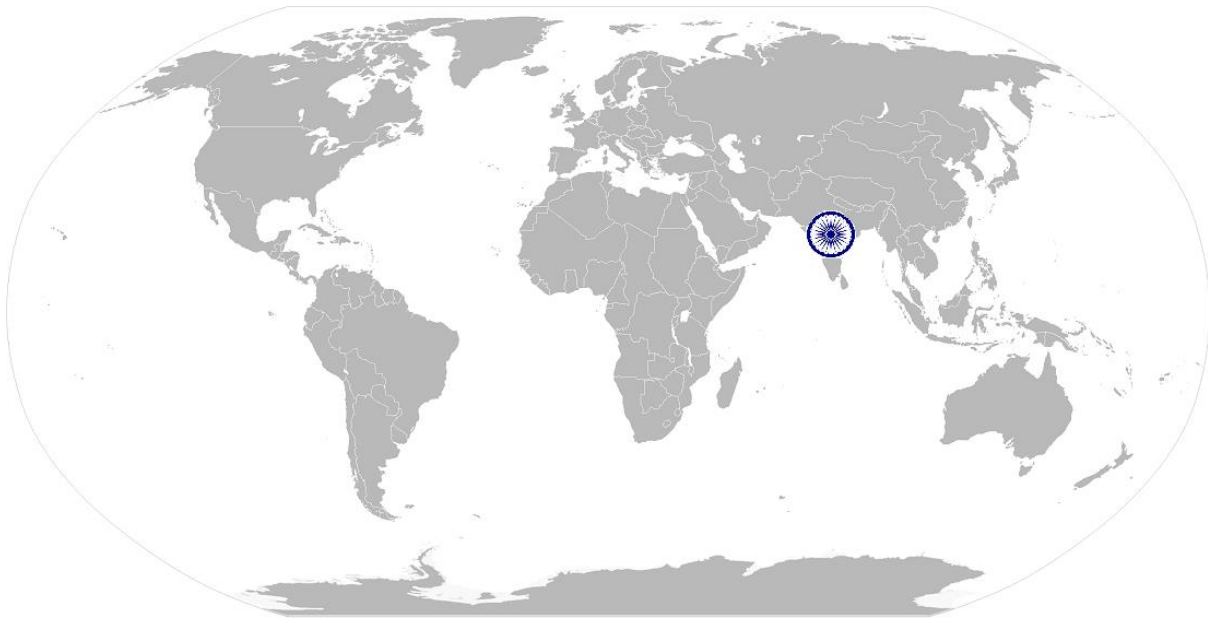
Keywords /Terms	Description
Sector	Sector is a conglomeration of different business operations having similar business and interests. It may also be defined as a distinct subset of the economy whose components share similar characteristics and interests.
Sub-sector	Sub-sector is derived from a further 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
CNC	Computer Numerically Controlled
OD	Outer Diameter
ID	Inner Diameter
DTI	Dial Test Indicators
CO ₂	Carbon Dioxide
CPR	Cardiac Pulmonary Resuscitation
PPE	Personal Protective Equipment

CSC/N0115 Perform turning operations on metal components using Computer Numerically Controlled (CNC) machines

National Occupational Standard



Overview

This unit covers the operation of Computer Numerically Controlled (CNC) machines, such as CNC lathe machine, in order to perform turning operations on metal or plastic components, as per specifications provided. It does not include machine setting or programming.

CSC/N0115 Perform turning operations on metal components using Computer Numerically Controlled (CNC) machines

National Occupational Standard

Unit Code	CSC/N0115
Unit Title (Task)	Perform turning operations on metal components using Computer Numerically Controlled (CNC) machines
Description	This unit covers the operations of Computer Numerically Controlled (CNC) lathe machines in order to perform turning operations on metal and plastic components, as per specifications provided. It does not include machine setting or programming. This involves removal of material from a rotating cylindrical work-piece.
Scope	This unit/task covers the following: <ul style="list-style-type: none"> • Work Safely • Prepare for performing turning operations using CNC machine • Carry out turning operations using CNC machine
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</p> <p>PC2. adhere to procedures and guidelines for personal protective equipment (PPE) and other relevant safety regulations while performing CNC turning operations</p> <p>Turning operations: Turning (OD, ID), facing, grooving (OD and ID), face grooving, thread cutting (OD and ID), drilling, boring and tapping</p> <p>Personal protective equipment: correctly fitting overalls; safety glasses; long hair is tied back or netted; removing any jewellery or other items that can become entangled in the machinery; covered shoes; face mask</p> <p>PC3. read and understand safety instructions, warning signs on the CNC machines used</p> <p>CNC machines used: 2-axis CNC lathe machine</p> <p>PC4. work following laid down procedures and instructions</p> <p>PC5. ensure work area is clean and safe from hazards</p> <p>Hazards associated with the use of CNC machines: automatic machine operations; revolving/moving parts of machinery; airborne and hot metal particles; sharp cutting tools; lifting and handling work-holding devices; burrs and sharp edges on component; use of power operated chucks; moving machinery; hot and airborne metal and particles and fluid</p> <p>PC6. ensure that all tools and equipment are in a safe and usable condition</p>
Prepare for performing turning	<p>To be competent, the user/individual on the job must be able to:</p> <p>PC7. obtain job specification from a valid source</p>

CSC/N0115 Perform turning operations on metal components using Computer Numerically Controlled (CNC) machines

<p>operations using CNC machine</p>	<p>Valid sources: job instruction sheet/job card; work drawing 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> <p>Job specification documents: detailed component drawings; approved sketches/illustrations; national, international and organizational standards; process drawing</p> <p>Job requirements: raw materials or components required (type, quality, quantity); dimensions; limits and tolerances; surface finish requirements; operations required (list, sequence and procedures where applicable); shape or profiles to be generated; instruments and tools to be used; form tolerances (flatness, concentricity, etc.); cycle time, production rate</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 turning operations as per procedure or operational specification</p> <p>Turning operations: Turning (OD, ID) facing, grooving (OD and ID), face grooving, thread cutting (OD and ID), drilling, boring and tapping</p> <p>PC11. perform daily maintenance of machine according to defined checklist, at the beginning of day's shifts</p> <p>Basic maintenance activities: replenish coolant; ensure all parts are clean; perform housekeeping tasks on the machine; remove and dispose swarf</p> <p>PC12. ensure that the components used are free from foreign objects, dirt or other contamination</p> <p>PC13. conduct a preliminary check of the readiness of the CNC turning machine used</p> <p>Preliminary check ensuring readiness: e.g. machine is clean, lubrication are functioning, coolant level is correct, sub-systems are working correctly, confirmation received from the machine setter that the machine is ready for production, received necessary instruction/training on specific operation of the machine, etc.</p> <p>CNC machines used: 2-axis CNC lathe machine</p> <p>PC14. obtain correct work-pieces/raw materials and consumables as per job requirements</p> <p>PC15. obtain appropriate cutting tools and hand tools and measuring tools as per job requirements</p> <p>Hand tools: hammer (ball peen, mallet), magnifying glass, allen keys, spanner, wrenches and deburring tools</p>
--------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

CSC/N0115 Perform turning operations on metal components using Computer Numerically Controlled (CNC) machines

	<p>Cutting tools: turning tool (OD and ID), grooving tool (OD and ID), parting tool, threading tool, form tools, centre drills, twist/insert drills and reamers</p> <p>Measuring equipments: steel rules, micrometers (external, internal, depth), verniers (digital, dial; length, depth; protractors), gauges (slip, bore/hole, thread, plug, radius/profile), dial test indicators (DTI), surface finish equipment (such as comparison plates) and height master</p> <p>PC16. ensure that all measuring equipment is calibrated and approved for usage</p> <p>PC17. set work pieces as per job requirements using appropriate positioning and/or holding devices and support mechanisms</p> <p>PC18. seek necessary instruction/training on the operation of the machine where required from appropriate sources</p> <p>PC19. check that the operating program is at the correct start point and the tool is at a safe position clear of the part</p> <p>PC20. perform basic daily maintenance activities as per the checklist given</p>
<p>Carry out turning operations using CNC machine</p>	<p>To be competent, the user/individual on the job must be able to:</p> <p>PC21. obtain the component drawings, specifications and/or job instructions required for the components to be machined</p> <p>PC22. use and extract information from engineering drawings, dimensioning and labeling data</p> <p>Drawings, dimensioning and labeling: projections (orthographic [first angle, third angle]; isometric [including exploded], sectional view); reference points, lines, edges and surfaces</p> <p>PC23. use and extract information from reference charts, tables, graphs and standards</p> <p>Information pertaining to: e.g. thread sizes; feeds and speeds; machining symbols and tolerances; surface finish symbols; etc.</p> <p>PC24. interpret the visual display and the various messages displayed correctly</p> <p>PC25. find the correct restart point in the program when the machine has been stopped before completion of the program</p> <p>PC26. load and unload component(s) using pre-determined fixtures or work holding devices as per work instructions</p> <p>Work-holding devices to position and secure work-pieces: chucks with hard jaws, chucks with soft jaws, fixtures, drive centres, collet chucks, faceplates, magnetic/pneumatic devices and other work-holding devices</p> <p>PC27. check correctness of program through dry run and single block check</p> <p>PC28. do first part cutting trial by setting tool offsets to get oversize part</p> <p>PC29. measure the critical parameters of the machined component on the machine (without removing from the machine), after the trial run</p> <p>Critical parameters: linear dimensions (such as lengths, depths), slots</p>

CSC/N0115 Perform turning operations on metal components using Computer Numerically Controlled (CNC) machines

	<p>(position, width, depth), flatness, surface finish, squareness, parallelism, hole size/fit, angles, recesses, thread fit, runout and roundness</p> <p>PC30. correct the offsets based on the measurements by accessing program edit facility in order to enter tooling data Tooling data: offsets compensation, radius compensation</p> <p>PC31. measure the component after unloading to check for accuracy in the critical parameters as per job specifications</p> <p>PC32. produce machined components that combine different turning operations and have a range of features Features of machined components produced: diameters (parallel, stepped, tapered), faces, undercuts (internal and external), profiles (internal and external), holes (reamed, tapped, drilled, bored), parting-off and threads (internal, external) Turning operations: Turning (OD, ID), facing, grooving (OD and ID), face grooving, thread cutting (OD and ID), drilling, boring and tapping</p> <p>PC33. follow the specified machining sequence and procedure as per job specifications</p> <p>PC34. interpret in-built machine alarms and respond to the same as per operating manual/organizational guidelines</p> <p>PC35. inspect as per frequency of inspection mentioned in the inspection plan (part of the job specifications)</p> <p>PC36. record the measured values as per organizational procedure</p> <p>PC37. observe for inconsistency in dimensions due to tool wear and correct the offsets accordingly</p> <p>PC38. ensure that machine settings are adjusted as and when required, either by self or the setter, to maintain the required accuracy</p> <p>PC39. identify when tools need replacing</p> <p>PC40. replace worn tool with new tool</p> <p>PC41. cut a trial part and adjust tool offsets after each tool change</p> <p>PC42. store finished components as well as raw material as per organizational procedure</p> <p>PC43. produce components as per standards applicable to the process Produce components standards: components to be free from false tool cuts, burrs and sharp edges; general dimensional tolerance +/- 0.1mm; specific dimensional tolerances within +/- 0.02mm; surface finish within 1.6µm; reamed holes within H8; screw threads 6G/6H; angles/tapers within +/- 15 sec; flatness and squareness 0.025mm per 25mm</p> <p>PC44. report problems and seek appropriate assistance in a timely manner</p> <p>PC45. deal with finished components as per organizational guidelines</p>
--	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

CSC/N0115 Perform turning operations on metal components using Computer Numerically Controlled (CNC) machines

	<p>PC46. complete documentation during and post operations as per organizational procedures</p> <p>PC47. return the machine and all tools and equipment to the correct location on completion of activities</p> <p>PC48. leave the work area in a safe and tidy condition on completion of job activities Safe conditions: correctly isolated; operating programs closed or removed; cleaning the machine; ensuring that any spilt cutting fluids are correctly dealt with; disposing of waste</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. 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. importance of working in clean and safe environment</p> <p>KA4. own job role and responsibilities and sources for information pertaining to employment terms, entitlements, job role and responsibilities</p> <p>KA5. reporting structure, interdependent functions, lines and procedures in the work area</p> <p>KA6. relevant people and their responsibilities within the work area</p> <p>KA7. escalation matrix and procedures for reporting work and employment related issues</p> <p>KA8. documentation and related procedures applicable in the context of employment and work</p> <p>KA9. importance and purpose of documentation in context of employment and work</p>
<p>B. Technical Knowledge</p>	<p>The user/individual on the job needs to know and understand:</p> <p>KB1. specific safe working practices, CNC turning procedures and environmental regulations that must be observed Safe working practices and procedures: ensuring the correct isolation of the machine before mounting work-holding devices and tooling; fitting and adjusting machine guards; ensuring that the work-piece is secure and that tooling is free from work-piece before starting the machine; the personal protective equipment (PPE) to be worn for the CNC turning activities; as correctly fitting overalls and safety glasses; ensuring that, if they have long hair, it is tied back or netted; removing any jewelry or other items that can become entangled in the machinery</p> <p>KB2. hazards associated with carrying out the machining operations on a CNC machine and how can they be minimized</p>

CSC/N0115 Perform turning operations on metal components using Computer Numerically Controlled (CNC) machines

	<p>Hazards associated with the use of CNC machines: automatic machine operations; revolving/moving parts of machinery; airborne and hot metal particles; sharp cutting tools; lifting and handling work-holding devices; burrs and sharp edges on component; use of power operated chucks; moving machinery; hot and airborne metal and particles and fluid</p> <p>KB3. safety mechanism on the machine and how to check if they are functioning properly Safety mechanisms on the CNC machine: emergency stop buttons, emergency brakes</p> <p>KB4. personal protective equipment to be used during the machining activities on a CNC machine and where can it be obtained Personal protective equipment: correctly fitting overalls; safety glasses; long hair is tied back or netted; removing any jewelry or other items that can become entangled in the machinery; covered shoes; face mask</p> <p>KB5. types and sources of appropriate job specifications Valid sources for job specifications: job instruction sheet/job card; work drawings and instructions; planning documentation; quality control documents; operation sheets; process specifications; instructions from supervisor</p> <p>KB6. common terminology used in CNC turning</p> <p>KB7. how to read and interpret first and third angle component drawings</p> <p>KB8. how to extract information from engineering drawings, dimensioning and labeling data Drawings, dimensioning and labeling: projections (orthographic [first angle, third angle], isometric [including exploded], sectional view); reference points, lines, edges and surfaces</p> <p>KB9. symbols and conventions to appropriate ISO standards in relation to work undertaken</p> <p>KB10. main features and working parts of the CNC machine, and the accessories that can be used</p> <p>KB11. importance of following specified machining sequences and procedures</p> <p>KB12. importance of ensuring suitability of work-pieces/materials and consumables for the specified job and related procedures</p> <p>KB13. tools and equipment used for machining operations on a CNC machines</p> <p>KB14. importance and procedures to ensure that tools and equipment are in a safe and usable condition</p> <p>KB15. various CNC turning operations that can be performed, and the methods and equipment used Turning operations: Turning (OD and ID), facing, grooving (OD and ID), face</p>
--	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

CSC/N0115 Perform turning operations on metal components using Computer Numerically Controlled (CNC) machines

	<p>grooving, thread cutting (OD and ID), drilling, boring and tapping</p> <p>KB16. correct techniques and procedures to carry out specific turning operations on a CNC lathe</p> <p>KB17. importance of using correct procedures as per raw material form of supply/shapes</p> <p>Raw material form of supply/shapes: square/rectangular (eg. bar stock, sheet material, machined components); circular/cylindrical (eg. bar stock, tubes, turned components, flat discs); irregular shapes/profile (eg. castings, forgings, odd shaped components)</p> <p>KB18. error messages on machine and taking appropriate corrective action</p> <p>KB19. importance of securing the work-piece/raw material correctly using appropriate devices and mechanisms</p> <p>KB20. importance of setting the work-holding device in relationship to the machine axis and reference points</p> <p>KB21. common problems that can occur in CNC turning operations and their implications</p> <p>KB22. correct procedures to address problems commonly encountered during CNC turning operations</p> <p>KB23. importance of reporting problems immediately and accurately</p> <p>KB24. meaning and importance of quality in relation to final and intermediate job output</p> <p>KB25. how to check the quality of machined components against the specified quality standards</p> <p>Quality Parametres: components to be free from false tool cuts, burrs and sharp edges; general dimensional tolerance +/- 0.1mm; specific dimensional tolerances within +/- 0.02mm; surface finish within 1.6µm; reamed holes within H8; screw threads 6G/6H; angles/tapers within +/- 15 sec; flatness and squareness 0.025mm per 25mm</p> <p>KB26. range of materials used in relevant CNC turning applications and their machinability characteristics</p> <p>Range of Materials: ferrous metals: eg. steel, stainless steel, cast iron; nonferrous metals: eg. aluminium, aluminium alloys, copper and copper alloys; non-metals: eg. plastics</p> <p>KB27. problems peculiar to machining of each raw material</p> <p>KB28. metric systems of measurement</p> <p>KB29. absolute and incremental systems of tool positioning and offsetting</p> <p>KB30. machine zero, work piece zero, work offsets, tool offsets</p> <p>KB31. tool nose radius compensation- its necessity and effects of not using it</p> <p>KB32. use of HSS, Tungsten carbide, Ceramic and Diamond indexible tips, and</p>
--	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

CSC/N0115 Perform turning operations on metal components using Computer Numerically Controlled (CNC) machines

	<p>factors which determine their selection and use</p> <p>Factors to determine selection and use of tungsten carbide, ceramic and diamond indexable tips: hardness of the material, the cutting characteristics of the material, tolerances to be achieved, component surface finish, component specifications</p> <p>KB33. use of various work holding devices – chuck, tailstock, steady rest</p> <p>Work-holding devices to position and secure work-pieces: chucks with hard jaws, chucks with soft jaws, fixtures, drive centres, collet chucks, faceplates, magnetic/pneumatic devices and other work-holding devices</p> <p>KB34. 1st and 2nd setup operation, use of hard and soft jaws</p> <p>KB35. deciding holding length, Jaw pressure setting</p> <p>KB36. importance of conducting cutting trial, methods of trial – dry run, single block checks, cutting with offset adjustment to get oversize part</p> <p>KB37. parameters to be checked before operating in auto mode – dimensions, surface finishes</p> <p>KB38. importance of periodic maintenance checks for the machine and what are the common maintenance checks</p> <p>Basic maintenance activities: replenish coolant; ensure all parts are clean; perform housekeeping tasks on the machine; remove and dispose swarf</p> <p>KB39. production cost, machine hour rate, raw material cost, tool cost, coolant cost, overheads, cycle time, idle time, cost of machine idling, part rejection cost</p> <p>KB40. selection of cutting tools, tool materials, chip breaker geometry, selecting cutting parameters from tool catalogues, selecting coolant</p> <p>Cutting tools: turning tool (OD and ID), grooving tool (OD and ID), parting tool, threading tool, form tools, centre drills, twist/insert drills and reamers</p> <p>KB41. relationship between surface finish, tool nose radius and feed rate</p> <p>KB42. factors that affect feed and speed</p> <p>Factors: type and condition of material, work-holding method, tooling used, tolerance to be achieved, finish to be achieved</p> <p>KB43. impact of depth of cut on chatter, surface finish</p> <p>KB44. extent of their own authority and to whom they should report if they have problems that they cannot resolve</p> <p>KB45. importance of leaving the work area and machine in a safe condition on completion of the activities</p> <p>Safe conditions: correctly isolated; operating programs closed or removed; cleaning the machine; ensuring that any spilt cutting fluids are correctly dealt with; disposing of waste</p>
Skills (S)	

CSC/N0115 Perform turning operations on metal components using Computer Numerically Controlled (CNC) machines

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. undertake numerical operations, and calculations/ formulae Numerical computations: addition, subtraction, multiplication, division, fractions and decimals, percentages and proportions, simple ratios and averages Algebraic expressions: represent numerical quantities using symbols, apply laws of precedence in the use of precedence (BODMAS) SA4. identify various basic, compound and solid shapes as per dimensions given Basic shapes: square, rectangle, triangle, circle Compound shapes: involving square, rectangles, triangles, circles, semi-circles, quadrants of a circle Solid shapes: cube, rectangular prism, cylinder SA5. use appropriate measuring techniques and units of measurement SA6. use appropriate units and number systems to express degree of accuracy Units and number systems representing degree of accuracy: decimals places, significant figures, fractions as a decimal quantity SA7. use metric systems of measurement SA8. Angles in a triangle: right-angled, isosceles, equilateral
B. Professional Skills	Oral Communication (Listening and Speaking skills)
	The user/individual on the job needs to know and understand how to: SA9. convey and share technical information clearly using appropriate language SA10. check and clarify task-related information SA11. liaise with appropriate authorities using correct protocol SA12. communicate with people in respectful form and manner in line with organizational protocol
	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

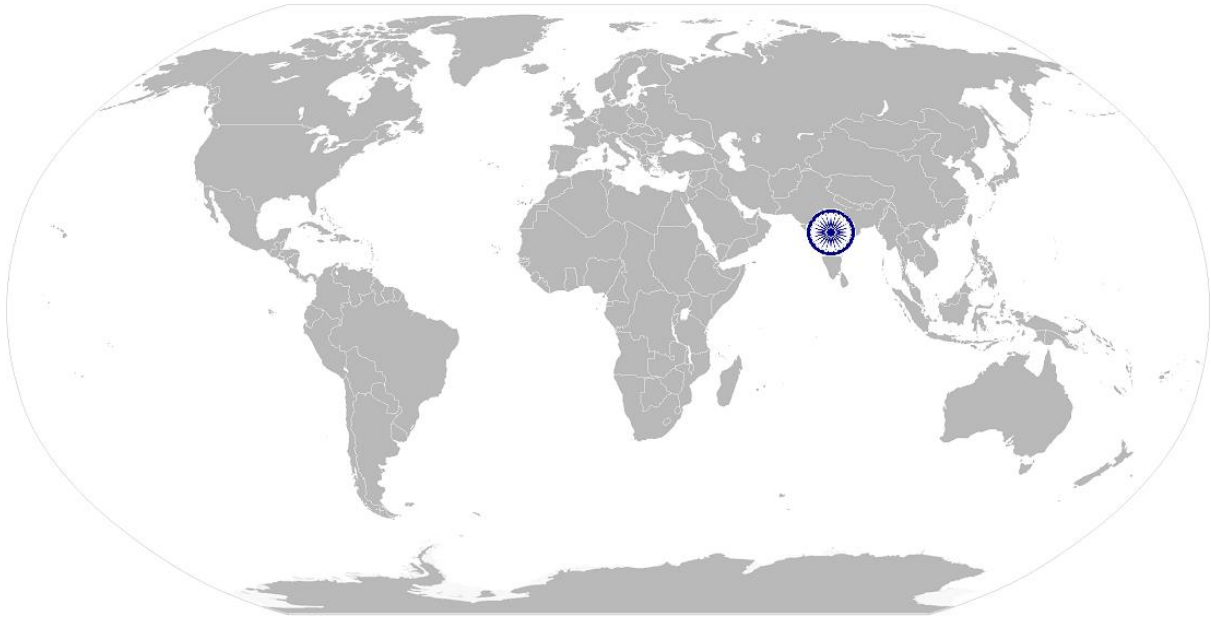
CSC/N0115 Perform turning operations on metal components using Computer Numerically Controlled (CNC) machines

	<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> <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>

CSC/N0115 Perform turning operations on metal components using Computer Numerically Controlled (CNC) machines

SB25. seek to improve and modify own work practices

SB26. maintain current knowledge of application standards, legislation, codes of practice and product/process developments

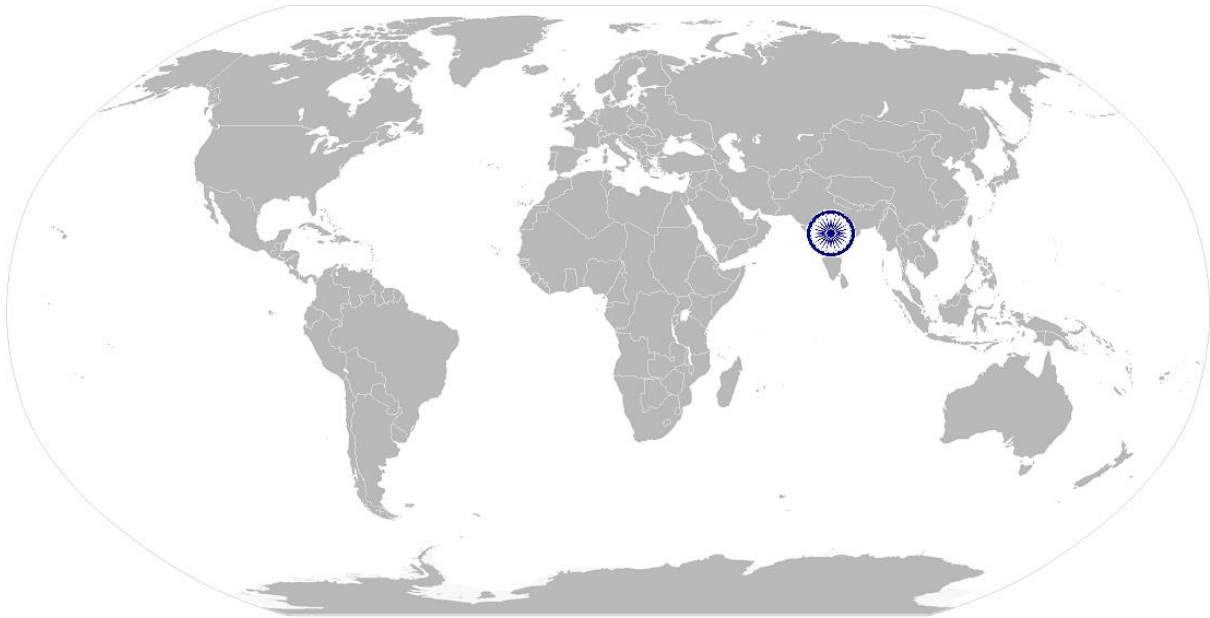


CSC/N0115 Perform turning operations on metal components using Computer Numerically Controlled (CNC) machines

NOS Version Control

NOS Code	CSC/N0115		
Credits	TBD	Version number	1.0
Industry	Capital Goods	Drafted on	10/04/2014
Industry Sub-sector	<ol style="list-style-type: none"> 1. Machine Tools 2. Dies, Moulds and Press Tools 3. Plastics Manufacturing Machinery 4. Textile Manufacturing Machinery 5. Process Plant Machinery 6. Electrical and Power Machinery 7. Light Engineering Goods 	Last reviewed on	24/11/2017
Occupation	Machining	Next review date	24/11/2021

National Occupational Standard



Overview

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

CSC/N1335

Use basic health and safety practices at the workplace

National Occupational Standard

Unit Code	CSC/N1335
Unit Title (Task)	Use basic health and safety practices at the workplace
Description	This OS unit is about knowledge and practices relating to health, safety and security that candidates need to use in the workplace. It covers responsibilities towards self, others, assets and the environment.
Scope	This unit/task covers the following: <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	To be competent, the user/individual on the job must be able to: <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; oxy fuel 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, tools and machines, intense light, load noise, obstructions in corridors, by doors, blind turns, noise, over stacked shelves and packages, etc.) electrical hazards (power supply and points, loose and naked cables and wires, electrical machines and appliances, etc.) Possible causes of risk and accident: physical actions; reading; listening to and giving instructions; inattention; sickness and incapacity (such as</p>

CSC/N1335


Use basic health and safety practices at the workplace

	<p>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 Documents: fire notices, accident reports, safety instructions for equipment</p>
--	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

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

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

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

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 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>

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

	KB16. different materials used for extinguishing fire Materials: sand, water, foam, CO ₂ , dry powder KB17. rescue techniques applied during a fire hazard KB18. various types of safety signs and what they mean KB19. appropriate basic first aid treatment relevant to the condition eg. shock, electrical shock, bleeding, breaks to bones, minor burns, resuscitation, poisoning, eye injuries KB20. content of written accident report KB21. potential injuries and ill health associated with incorrect manual handling KB22. safe lifting and carrying practices KB23. personal safety, health and dignity issues relating to the movement of a person by others KB24. potential impact to a person who is moved incorrectly
Skills (S)	
A. Core Skills/ Generic Skills	Reading Skills
	The user/ individual on the job needs to know and understand how to: SA1. read and comprehend basic content to read labels, charts, signages SA2. read and comprehend basic English to read manuals of operations SA3. read an accident/incident report in local language or English
	Writing Skills
	The user/individual on the job needs to know and understand how to: SA4. write an accident/incident report in local language or English
	Oral Communication (Listening and Speaking skills)
	The user/individual on the job needs to know and understand how to: SA5. question coworkers appropriately in order to clarify instructions and other issues SA6. give clear instructions to coworkers, subordinates others
B. Professional Skills	Decision Making
	The user/individual on the job needs to know and understand how to: SB1. make appropriate decisions pertaining to the concerned area of work with respect to intended work objective, span of authority, responsibility, laid down procedure and guidelines
	Plan and Organize
	The user/individual on the job needs to know and understand how to: SB2. plan and organize their own work schedule, work area, tools, equipment and materials to maintain decorum and for improved productivity
	Customer Centricity
	The user/individual on the job needs to know and understand how to:

CSC/N1335

Use basic health and safety practices at the workplace

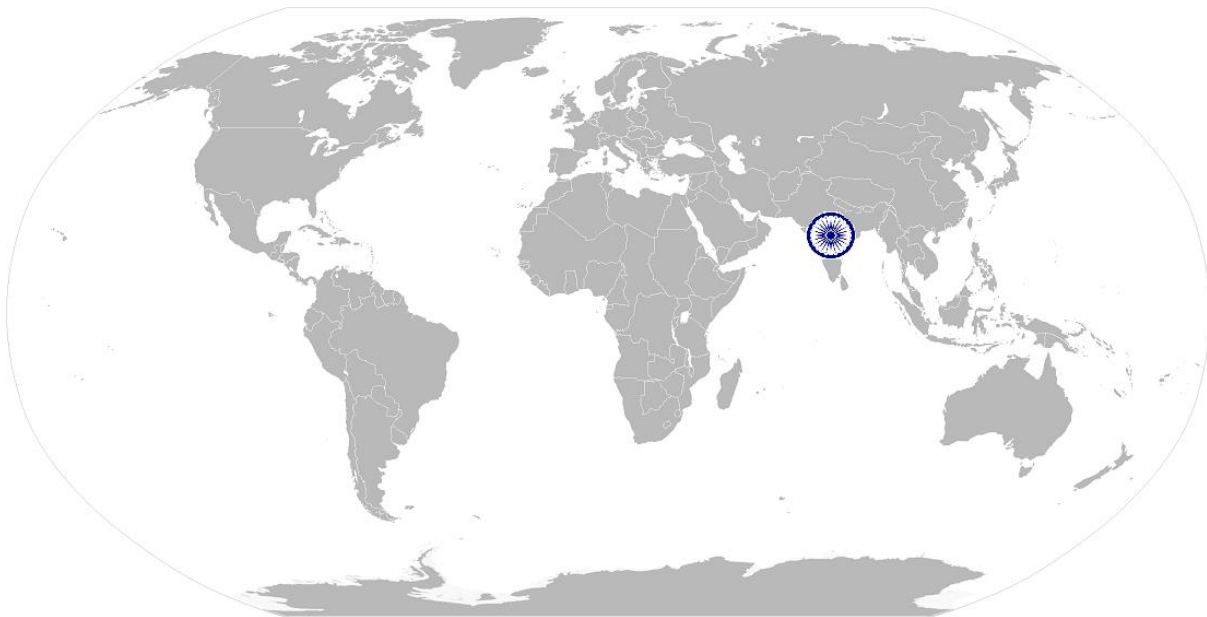
	<p>SB3. remain congenial while discussing and debating issues with co-workers</p> <p>SB4. follow appropriate protocols for communication based on situation, hierarchy, organizational culture and practice</p> <p>SB5. ask for, provide and receive required assistance where possible to ensure achievement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

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

NOS Version Control

NOS Code	CSC/N1335		
Credits	TBD	Version number	1.0
Industry	Capital Goods	Drafted on	10/04/2014
Industry Sub-sector	<ol style="list-style-type: none"> 1. Machine Tools 2. Dies, Moulds and Press Tools 3. Plastics Manufacturing Machinery 4. Textile Manufacturing Machinery 5. Process Plant Machinery 6. Electrical and Power Machinery 7. Light Engineering Goods 	Last reviewed on	24/11/2017
Occupation	Machining	Next review date	24/11/2021

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

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. accurately receive information and instructions from the supervisor and fellow workers, getting clarification where required</p> <p>PC2. accurately pass on information to authorized persons who require it and within agreed timescale and confirm its receipt</p> <p>PC3. give information to others clearly, at a pace and in a manner that helps them to understand</p> <p>PC4. display helpful behavior by assisting others in performing tasks in a positive manner, where required and possible</p> <p>PC5. consult with and assist others to maximize effectiveness and efficiency in carrying out tasks</p> <p>PC6. display appropriate communication etiquette while working 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 / organization and	<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

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

CSC/N1336


Work effectively with others

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

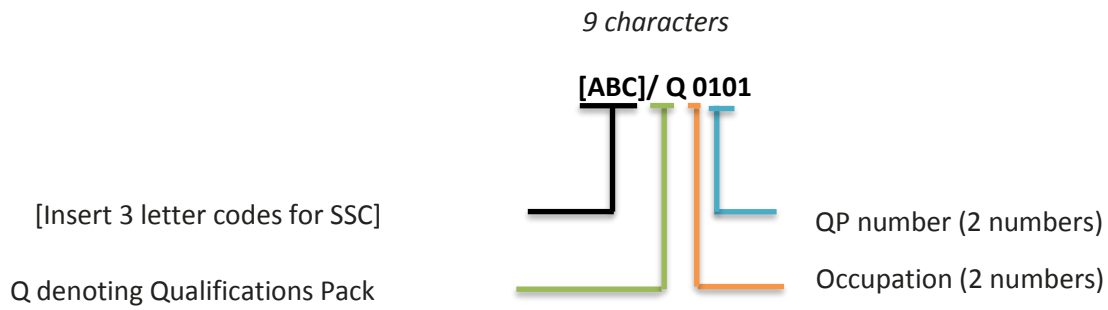
NOS Version Control

NOS Code	CSC/N1336		
Credits	TBD	Version number	1.0
Industry	Capital Goods	Drafted on	10/04/2014
Industry Sub-sector	1. Machine Tools 2. Dies, Moulds and Press Tools 3. Plastics  Manufacturing Machinery 4. Textile Manufacturing Machinery 5. Process Plant Machinery 6. Electrical and Power Machinery 7. Light Engineering Goods	Last reviewed on	24/11/2017
Occupation	Machining	Next review date	24/11/2021

Annexure

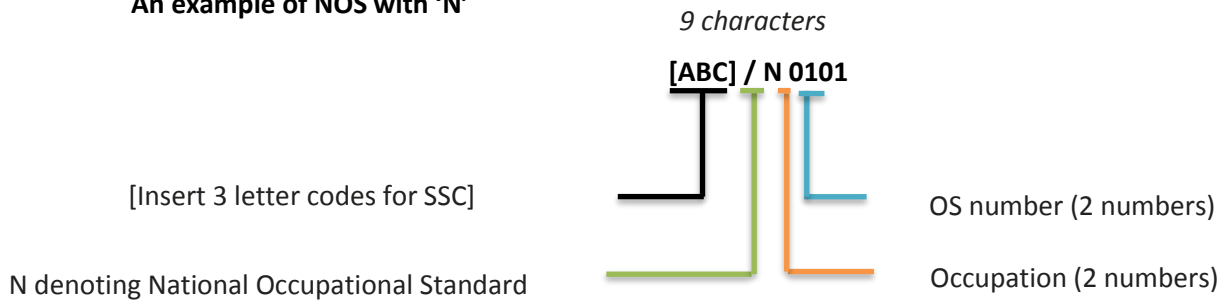
Nomenclature for QP and NOS

Qualifications Pack



Occupational Standard

An example of NOS with 'N'



[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: CNC Operator - Turning

Qualification Pack: CSC/Q0115

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.

Total Marks: 300		Compulsory NOS		Marks Allocation	
Assessment outcomes	Assessment Criteria for outcomes	Total Marks	Out of	Theory	Skills Practical
CSC/N0115 Perform turning operations on metal components using Computer Numerically Controlled (CNC) machines	PC1. comply with health and safety, environmental and other relevant regulations and guidelines at work	100	2	1	1
	PC2. adhere to procedures and guidelines for personal protective equipment (PPE) and other relevant safety regulations while performing CNC turning operations		3	1	2
	PC3. read and understand safety instructions, warning signs on the machine used		2	0	2
	PC4. work following laid down procedures and instructions		2	1	1
	PC5. ensure work area is clean and safe from hazards		1	0	1
	PC6. ensure that all tools and equipment are in a safe and usable condition		1	0	1

PC7. obtain job specification from a valid source	1	0	1
PC8. read and establish job requirements from the job specification document accurately	2	1	1
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 turning operations as per procedure or operational specification	2	1	1
PC11. perform daily maintenance of machine according to defined checklist, at the beginning of day's shifts	3	1	2
PC12. ensure that the components used are free from foreign objects, dirt or other contamination	1	0	1
PC13. conduct a preliminary check of the readiness of the CNC turning machine used	2	0	2
PC14. obtain correct work-pieces/raw materials and consumables as per job requirements	2	1	1
PC15. obtain appropriate cutting tools and hand tools and measuring tools as per job requirements	2	1	1
PC16. ensure that all measuring equipment is calibrated and approved for usage	2	0	2
PC17. set work pieces as per job requirements using appropriate positioning and/or holding devices and support mechanisms	3	1	2
PC18. seek necessary instruction/training on the operation of the machine where required from appropriate sources	2	0	2
PC19. check that the operating program is at the correct start point and the tool is at a safe position clear of the part	2	0	2
PC20. perform basic daily maintenance activities as per the checklist given	2	1	1
PC21. obtain the component drawings, specifications and/or job instructions required for the components to be machined	1	0	1
PC22. use and extract information from engineering drawings, dimensioning and labeling data	2	0	2
PC23. use and extract information from reference charts, tables, graphs and standards	2	0	2

PC24. interpret the visual display and the various messages displayed correctly	2	0	2
PC25. find the correct restart point in the program when the machine has been stopped before completion of the program	2	0	2
PC26. load and unload component(s) using pre-determined fixtures or work holding devices as per work instructions	3	1	2
PC27. check correctness of program through dry run and single block check	2	0	2
PC28. do first part cutting trial by setting tool offsets to get oversize part	3	0	3
PC29. measure the critical parameters of the machined component on the machine (without removing from the machine), after the trial run	3	0	3
PC30. correct the offsets based on the measurements by accessing program edit facility in order to enter tooling data	3	0	3
PC31. measure the component after unloading to check for accuracy in the critical parameters as per job specifications	4	1	3
PC32. produce machined components that combine different turning operations and have a range of features	4	1	3
PC33. follow the specified machining sequence and procedure as per job specifications	2	1	1
PC34. interpret in-built machine alarms and respond to the same as per operating manual/organizational guidelines	2	1	1
PC35. inspect as per frequency of inspection mentioned in the inspection plan (part of the job specifications)	2	1	1
PC36. record the measured values as per organizational procedure	1	0	1
PC37. observe for inconsistency in dimensions due to tool wear and correct the offsets accordingly	3	1	2
PC38. ensure that machine settings are adjusted as and when required, either by self or the setter, to maintain the required accuracy	2	0	2
PC39. identify when tools need replacing	2	0	2
PC40. replace worn tool with new tool	1	0	1
PC41. cut a trial part and adjust tool offsets after each tool change	1	0	1

	PC42. store finished components as well as raw material as per organizational procedure		2	1	1
	PC43. produce components as per standards applicable to the process		3	1	2
	PC44. report problems and seek appropriate assistance in a timely manner		2	0	2
	PC45. deal with finished components as per organizational guidelines		2	1	1
	PC46. complete documentation during and post operations as per organizational procedures		2	1	1
	PC47. return the machine and all tools and equipment to the correct location on completion of activities		1	0	1
	PC48. leave the work area in a safe and tidy condition on completion of job activities		1	0	1
		Total	100	22	78
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.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