

QUALIFICATIONS PACK - OCCUPATIONAL STANDARDS FOR AUTOMOTIVE INDUSTRY

What are Occupational Standards (OS)?

- OS describe what individuals need to do, know and understand in order to carry out a particular job role or function
- OS are performance standards that individuals must achieve when carrying out functions in the workplace, together with specifications of the underpinning knowledge and understanding

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Contents

1. Introduction and Contacts.....P.1
2. Qualifications Pack.....P.2
3. Glossary of Key Terms P.3
4. NOS Units.....P.6
5. Assessment Criteria.....P 34

Introduction

Qualification Pack- Tool Room operator

SECTOR: AUTOMOTIVE

SUB-SECTOR: MANUFACTURING

OCCUPATION: TOOL ROOM OPERATOR

JOB ROLE: TOOL ROOM OPERATOR

REFERENCE ID: ASC/Q4101

ALIGNED TO: NCO-2004/7222.20/7222.50

Tool Room Operator: This role entails understanding the tool design and creating the tool and the die using various machining and assembly operations

Brief Job Description: Tool room operator covers operations of different machine tools performed both manually and through automatic/ CNC machines/ robots. This role primarily involves all kinds of machining and in-line inspection activities for quality verification, ad hoc repair work, change of worn out parts, gauging and de-burring activities. The operator also looks after the various tool assembly processes

Personal Attributes: The individual should be detailed oriented, observant; should have the ability of operation monitoring i.e., observing gauges , dials etc., good level of hand eye coordination, maintaining arm steadiness, ability to quickly move hand to grasp and assemble objects (Dexterity), high precision working ,reading, writing and communication skills, eye for detail and sensitivity towards safety for self and equipment. The role holder should also be able to visualize the final product output from the 2D drawing supplied to him by the design team.

Job Details

Qualifications Pack Code	ASC/Q4101		
Job Role	Tool room operator		
Credits(NSQF)	TBD	Version number	1.0
Industry	Automotive	Drafted on	20/10/2013
Sub-sector	Manufacturing	Last reviewed on	6/11/2013
Occupation	Tool Room	Next review date	Under revision expected date of revised version 31-Dec-15
NSQC Clearance on	20/07/15		

Job Role	Tool room operator
Role Description	Responsible for manufacturing and assembly of tools and dies and fitting the tools and dies at the customer end as per the requirements
NSQF level	4
Minimum Educational Qualifications	ITI - Mechanical
Maximum Educational Qualifications	Graduate in Science
Training (Suggested but not mandatory)	<ul style="list-style-type: none"> Basic tool manufacturing and assembly techniques Usage of assembly tools 5S and Safety Problem solving Quality Management
Minimum Job Entry Age	<p>1 ASDC recommends that candidates should seek full employment not before attaining an age of 18 years.</p> <p>2 However, as per Factories Act 1948 :</p> <ul style="list-style-type: none"> - No one can be employed before attaining the age of 15 - A person between the age of 15 – 18 (both inclusive) could be employed only with employers who follow safety and security systems & processes and also that the employee in this bracket will be working under supervision. <p>3 Please note that under the Factories Act 1948, different States may have slightly varying provision which need to be adhered to.</p>
Experience	2-3 years in Tool Room/ Machinist
Occupational Standards (OS)	<ol style="list-style-type: none"> ASC/4101: Understand the machining and assembling processes and equipment requirements to complete the task ASC/N4102: Prepare the machine, auxiliary apparatus and metal work pieces for manufacturing and assembly for tools and dies ASC/N4103: Perform the tool and die manufacturing process ASC/N4104: Perform the tool and die assembly operations ASC/N0006: Maintain a safe and healthy working environment ASC/N0021: Maintaining 5S at the work premises <p>Optional: N.A.</p>

Performance Criteria	As described in the relevant NOS 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.

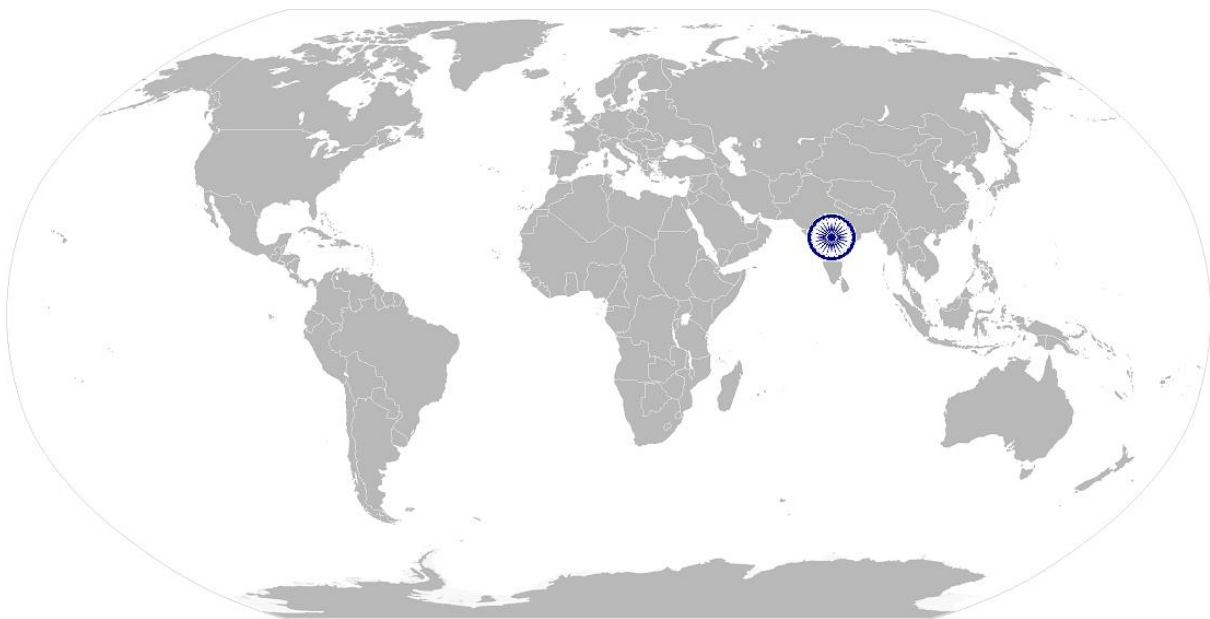
Acronyms

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.
Keywords /Terms	Description
NOS	National Occupational Standard(s)
NSQF	National Skills Qualifications Framework
OEM	Original Equipment Manufacturer
OS	Occupational Standard(s)
QP	Qualifications Pack

ASC/N4101

Understand the machining and assembling processes and equipment requirements to complete the task

National Occupational Standards



Overview

This unit is about understanding the job requirement and hence understand the activities & equipment associated with the process to complete the task.

ASC/N4101

Understand the machining and assembling processes and equipment requirements to complete the task

National Occupational Standard	Unit Code	ASC/N4101
	Unit Title (Task)	Understand the machining and assembling processes and equipment requirements to complete the task
	Description	This NOS unit is about understanding the job requirement, what processes need to be executed, what equipment's will be used for the activity and what is the required output considering the standards specified
	Scope	<p>The tool room operator will be responsible for</p> <ul style="list-style-type: none"> • understanding the process and equipment requirements • escalations of any queries regarding the job <p>The job holder will cover tool& die manufacturing methods like machining, grinding and assembly processes like fitting, bolting, tightening for manufacturing of tools and dies. The role holder will interact with the tool designer, maintenance team and material management team</p>
	Performance Criteria (PC) w.r.t. the Scope	
	Element	Performance Criteria
	Understand the machining & assembling requirements, equipment and parameters to be set for the process	<p>PC1. Ensure that all the drawings, sketches and models are understood at the beginning of the process to finalize the operations to be performed by the operator</p> <p>PC2. Ensure accurate understanding of the Geometric Dimensions and Tolerance before initiating the tool and die making process</p> <p>PC3. Understand the right machining & assembling methodology and process to be adopted for completing the work order through discussions with the supervisor/ master technician and reading the process manuals/ Work Instructions/Standard Operating Procedures</p> <p>PC4. Understand the various machining processes (manual as well as on CNC) like grinding, tapering, milling, boring, cutting etc. which will be required during the tool making and die making process</p> <p>PC5. Understand the material required and the equipment availability for executing the activity</p> <p>PC6. Understand the various assembling process parameters like cycle time, fitting tolerances, torque application, bolting and fastening before starting the assembling process, as mentioned in the Work Instructions/ SOP manual</p> <p>PC7. Understand 5 S related to the work station and line area</p> <p>PC8. Clearly understanding the do's and don'ts of the manufacturing process as defined in SOPs/ Work Instructions or defined by supervisors</p>
	Escalations of queries on the given job	<p>PC9. In case while understanding the drawings and sketches some problems are observed, ensure that they are highlighted to the design team</p> <p>PC10. Refer the queries to a competent internal specialist if they cannot be resolved by the operator on own</p> <p>PC11. Obtain help or advice from specialist if the problem is outside his/her area of competence or experience</p> <p>PC12. Confirm self-understanding with the specialist holding discussions so that all doubts & queries can be resolved before the actual process execution</p>

ASC/N4101

Understand the machining and assembling processes and equipment requirements to complete the task

Knowledge and Understanding (K) w.r.t. the scope	
Element	Knowledge and Understanding
A. Organizational Context (Knowledge of the company / organization and its processes)	The user/individual on the job needs to know and understand: <ul style="list-style-type: none"> KA1. relevant standards and procedures followed in the company KA2. different types of products manufactured by the company KA3. functional processes like Procurement, Store management, inventory management, quality management and key contact points for query resolution
B. Technical Knowledge	The user/individual on the job needs to know and understand: <ul style="list-style-type: none"> KB1. how to read engineering drawings, sketches, work orders KB2. Geometric Dimension and Tolerance limits KB3. different types of machining tools like Electric Discharge Machine based Machining operations, Vertical Machining Centre, rub machining and wire cutting etc. KB4. different types of processes like drilling, fitting, grinding boring, cutting KB5. different types of assembling processes like bolting, torqueing and tightening and associated equipment KB6. the method of reading and interpreting the various measurement gauges KB7. how to visualize the final product output and conduct quality verification tests. KB8. the impact of various physical parameters like machining, torqueing and tightening on the properties of final output product KB9. hazards and safety aspects involved in assembling activities and usage of relevant PPEs
Skills (S) [Optional]	
Element	Skills
A. Core Skills/ Generic Skills	Writing Skills
	The user/ individual on the job needs to know and understand how to: <ul style="list-style-type: none"> SA1. document the available information SA2. note down observations (if any) in the given format SA3. write information documents to internal departments/ internal teams or enter the information in online ERP systems under guidance of the supervisor
	Reading Skills
	The user/individual on the job needs to know and understand how to: <ul style="list-style-type: none"> SA4. read and interpret technical specifications of the specimen SA5. read equipment manuals and process documents to understand the equipment's and processes better SA6. read internal information documents sent by internal teams SA7. read and interpret technical customer drawings SA8. read engineering drawings and symbols used in drawings and sketches
Oral Communication (Listening and Speaking skills)	

ASC/N4101

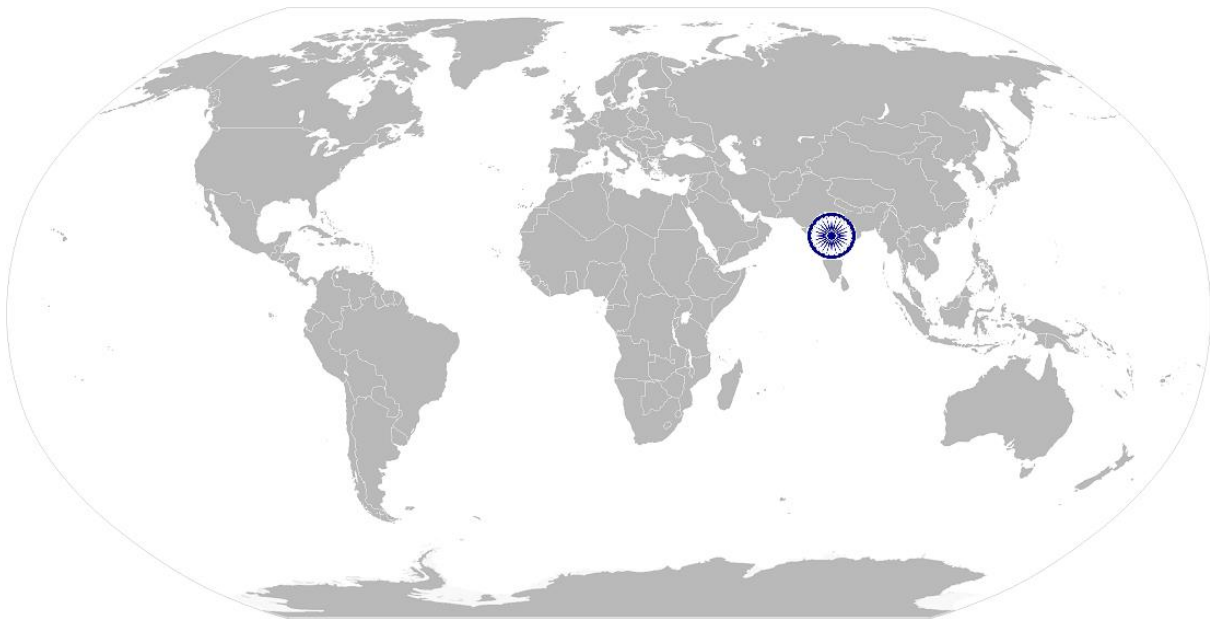
Understand the machining and assembling processes and equipment requirements to complete the task

	<p>The user/individual on the job needs to know and understand how to:</p> <p>SA9. discuss task lists, schedules and activities with the supervisor</p> <p>SA10. effectively communicate with the team members</p> <p>SA11. question the shop supervisor in order to understand the nature of the problem and to clarify queries</p> <p>SA12. attentively listen with full attention and comprehend the information given by the speaker</p>
B. Professional Skills	Plan and Organize
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB1. plan and organize the work order and jobs received from the Operator</p> <p>SB2. organize all process/ equipment manuals so that sorting/ accessing information is easy</p> <p>SB3. support the supervisor in scheduling tasks for tool room helper</p>
	Judgment and Critical Thinking
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB4. use common sense and make judgments during day to day basis</p> <p>SB5. use reasoning skills to identify and resolve basic problems</p> <p>use intuition and keen observation skills to detect any potential problems which could arise during operations</p>
	Desire to learn and take initiatives
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB6. follow instructions and work on areas of improvement identified</p> <p>SB7. complete the assigned tasks with minimum supervision</p> <p>SB8. complete the job defined by the supervisor within timelines and quality norms</p>
	Problem Solving and Decision making
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB9. detect problems in day to day tasks</p> <p>SB10. support supervisor in using specific problem solving techniques and detailing out the problems</p> <p>SB11. discuss possible solution with the supervisor for problem solving</p> <p>SB12. make decisions in emergency conditions in case the supervisor is not available(as per the authority matrix defined by the organization)</p>

ASC/N 4102

Prepare the machine, auxiliary apparatus and metal work pieces for
manufacturing and assembly for tools and dies

National Occupational Standards



Overview

This unit is about preparing the machine, auxiliary apparatus and the metal work pieces.

ASC/N 4102

Prepare the machine, auxiliary apparatus and metal work pieces for manufacturing and assembly for tools and dies

National Occupational Standard

Unit Code	ASC/N4102
Unit Title (Task)	Prepare the machine, auxiliary apparatus and metal work pieces for manufacturing and assembly for tools and dies
Description	This NOS unit is about preparing the surface of the metal parts by removing dust, moistures etc., cleaning the manufacturing and assembling apparatus and installing the metal parts on the manufacturing and assembling machine
Scope	<p>The tool room operator will be responsible for</p> <ul style="list-style-type: none"> • arranging for equipment and material required for the tool/ die design • cleaning the equipment and setting the same for the process • escalations of any queries <p>The job holder will cover tool & die manufacturing methods like machining, grinding and assembly processes like fitting, bolting, tightening for manufacturing of tools and dies. The role holder will interact with the tool designer, maintenance team and material management team</p>
Performance Criteria (PC) w.r.t. the Scope	
Element	Performance Criteria
Arrange for working equipment and material	<p>PC1. Understand the material required and the equipment availability for executing the activity</p> <p>PC2. Ensure that the related engineering drawings and sketches are available before starting the tool & die manufacturing process</p> <p>PC3. Ensure that the required material is procured from the store before starting the machining process</p> <p>PC4. Ensure that the helper/ assistant technician brings the required material and tools before the start of the assembling operations</p> <p>PC5. Ensure that the machines like grinders, lather machines, CNC operator wire cut and EDM machines and tools like Bolting guns, rivet guns, nuts, bolts, screw drivers, wrenches, hacksaws, hammers etc. required for Tool & Die manufacturing and assembly are available for operations</p> <p>PC6. Ensure that the correct machine specifications are set in the machine before the start of operation</p>
Clean the machining/assembling equipment before executing the operations and setup the equipment	<p>PC7. Ensure that the helper/ assistant operator cleans the surface of the machines (Wire Cutting/ EDM/ Assembly tools) to remove dust and any other impurities like grease, oil, paint etc.</p> <p>PC8. Ensure that the assembly apparatus is setup as per the selected assembling process and the internal SOPs/ Work Instructions and the setting standards for the machine</p> <p>PC9. Ensure that the calibration of the manufacturing tools and measuring tools is accurate</p>
Escalations of queries for the given job	<p>PC10. Immediately refer the queries to the supervisor to avoid any delay in the actual process</p> <p>PC11. Confirm self-understanding to the supervisor/ master technician during the</p>

ASC/N 4102

Prepare the machine, auxiliary apparatus and metal work pieces for manufacturing and assembly for tools and dies

	discussions so that all doubts & queries can be resolved before the actual process execution
Knowledge and Understanding (K) w.r.t. the scope	
Element	Knowledge and Understanding
A. Organizational Context (Knowledge of the company / organization and its processes)	<p>The user/individual on the job needs to know and understand:</p> <p>KA1. relevant standards and procedures followed in the company</p> <p>KA2. different types of products manufactured by the company</p> <p>KA3. functional processes like Procurement, Store management, inventory management, quality management and key contact points for query resolution</p>
B. Technical Knowledge	<p>The user/individual on the job needs to know and understand:</p> <p>KB1. different types of machining processes like grinding , broaching , tapering, wire cutting , honing etc.</p> <p>KB2. how to read and interpret engineering drawings, sketches and models provided the tool and die design team</p> <p>KB3. how to use manual as well as CNC operated machines and tools</p> <p>KB4. how to use wire cutting and EDM machines</p> <p>KB5. different types of joining/ assembling processes like welding, brazing, tightening, riveting, bolting and equipment associated with these processes</p> <p>KB6. the impact of various physical parameters like torqueing and tightening on the properties of final output product like durability, surface finish, part movement, aesthetics</p> <p>KB7. the method of reading and interpreting the various measurement gauges</p> <p>KB8. Basics of algebra and trigonometry</p> <p>KB9. how to visualize the final product output</p> <p>KB10. hazards and safety aspects involved in assembling activities and usage of relevant PPEs</p>
Skills (S) w.r.t. the scope	
Element	Skills
A. Core Skills/ Generic Skills	Writing Skills
	<p>The user/ individual on the job needs to know and understand how to:</p> <p>SA1. document information</p> <p>SA2. note down observations (if any) related to the process</p> <p>SA3. write information documents to internal departments/ internal teams or enter the information in online ERP systems under guidance of the supervisor</p>
	Reading Skills
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SA4. read and interpret technical specifications of the assemble specimen</p> <p>SA5. read equipment manuals and process documents to understand the equipment's and processes better</p> <p>SA6. read internal information documents sent by internal teams</p> <p>SA7. read and interpret engineering drawings</p>
	Oral Communication (Listening and Speaking skills)

ASC/N 4102

Prepare the machine, auxiliary apparatus and metal work pieces for manufacturing and assembly for tools and dies

	<p>The user/individual on the job needs to know and understand how to:</p> <p>SA8. discuss task lists, schedules and activities with the supervisor</p> <p>SA9. effectively communicate with the team members</p> <p>SA10. question the supervisor in order to understand the nature of the problem and to clarify queries</p> <p>SA11. attentively listen with full attention and comprehend the information given by the speaker</p>
B. Professional Skills	Plan and Organize
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB1. plan and organize the work order and jobs received from the Operator</p> <p>SB2. organize all process/ equipment manuals so that sorting/ accessing information is easy</p>
	Analytical Thinking
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB3. visualize the final job product after understanding the given drawing/ sketches</p> <p>SB4. co relate the type of job output required with the machining/ assembling methodology to be used</p> <p>SB5. identify the strengths and weakness of various assembling process</p>
	Judgment and Critical Thinking
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB6. use common sense and make judgments during day to day basis</p> <p>SB7. use reasoning skills to identify and resolve basic problems</p>
	Desire to learn and take initiatives
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB8. follow instructions and work on areas of improvement identified and complete the assigned tasks with minimum supervision</p> <p>SB9. complete the job defined by the supervisor within the timelines and quality norms</p> <p>SB10. take self-initiatives in driving small projects with the supervisor like operation improvement, training of helpers and assistant operators, 5S, Kaizen etc</p>

ASC/N 4102

Prepare the machine, auxiliary apparatus and metal work pieces for manufacturing and assembly for tools and dies

NOS Version Control

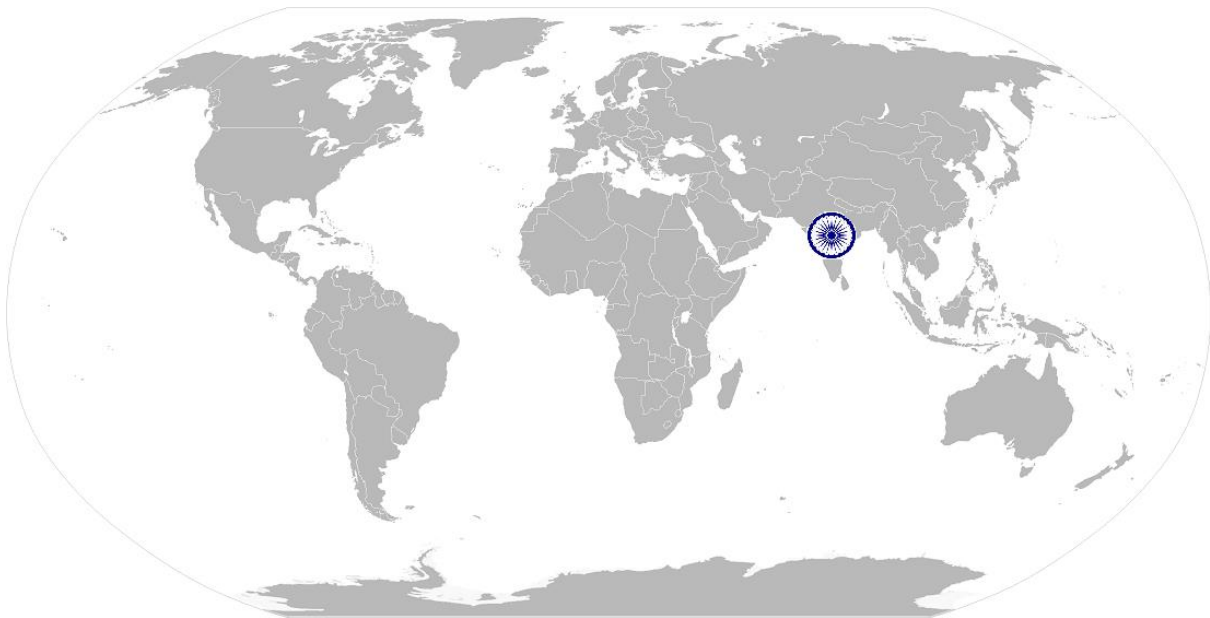
NOS Code	ASC/N4102		
Credits(NSQF)	TBD	Version number	1
Industry	Automotive	Drafted on	20/10/2013
Industry Sub-sector	Manufacturing	Last reviewed on	6/11/2013
Occupation	Tool Room	Next review date	Under revision expected date of revised version 31-Dec-15
		NSQC Clearance on	24/07/15



ASC/N4103

Perform the tool and die manufacturing process

National Occupational Standard



Overview

This unit is about manufacturing the Tool & Die as per the design specifications available

ASC/N4103
Perform the tool and die manufacturing process
National Occupational Standard

Unit Code	ASC /N4103
Unit Title (Task)	Performing the Tool and Die manufacturing operations
Description	This NOS is about manufacturing the tool/ die using various machining techniques, conducting quality inspections and fitting the tool/ die at the customer end
Scope	<p>The tool room operator will be responsible for</p> <ul style="list-style-type: none"> • using special purpose/ CNC operated machines for manufacturing tools and dies • maintaining data of production and rejection • escalations of any queries <p>The job holder will cover tool & die manufacturing methods like machining, grinding and assembly processes like fitting, bolting, tightening for manufacturing of tools and dies. The role holder will interact with the tool designer, maintenance team and material management team</p>
Performance Criteria(PC) w.r.t. the Scope	
Element	Performance Criteria
Carry out tool and die manufacturing activities using Special Purpose Machines, manual machining tools, and wire cutting machines	<p>PC1. Ensure that the operator receives the 2D drawing from the design team</p> <p>PC2. Study the drawings/ sketches to understand the operations to be performed by the operator/ machinist and plan sequences of operations for fabricating tools, dies or assemblies</p> <p>PC3. Select metals to be used based on properties like hardness and tolerance for forming the tool</p> <p>PC4. Measure and mark the metal to lay out machining using instruments such as protractors or micrometres</p> <p>PC5. Lift the work pieces/ metal blocks on the working platform using appropriate lifting tools like hoists, cranes, chain pulley, angle plates</p> <p>PC6. Ensure that the work pieces are sized as per the requirement using power operated/ manual/ automatic cutting tools like hacksaws, sawing blades</p> <p>PC7. Conduct Rough machining for initial block sizing. Ensure that the block is properly bolted on the machining block and machining activities are carried out as per the product requirement</p> <p>PC8. Operate CNC machines like lathes, milling machines, boring machines and grinders to cut , bore , grind the material to achieve the prescribed shape and dimension</p> <p>PC9. Ensure that the right program is selected for operating the CNC machine tools</p> <p>PC10. In case of manual tools, ensure correct setting of drill presses, boring tools, hacksaws, grinders as per the process requirement mentioned in the Work Instructions/ SOP manuals</p> <p>PC11. Cut , shape and trim blanks to specified lengths or shapes using the CNC machines</p> <p>PC12. Use wire cutting and Vertical Machining Centre technique to cut the blocks into separate pieces</p> <p>PC13. Ensure that the metal block is properly loaded on the VMC machine to mill the block as per requirement</p> <p>PC14. Ensure that the machine operations are regularly monitored to detect any</p>

ASC/N4103

Perform the tool and die manufacturing process

	<p>malfunctions in machine operations or any out of tolerance machining</p> <p>PC15. Verify the conformance of the output product to the specifications mentioned in the Work Instructions/ SOPs using precision measurement tools</p> <p>PC16. Ensure that routine maintenance activities are carried out by the operator as per the checklist provided by the maintenance team</p> <p>PC17. Ensure that any impurities like grease, oil, dust, rust etc. is periodically cleaned from the machining equipment</p>
Creation of through holes using Electric Discharge Machining (EDM)	<p>PC18. Use Electric Discharge Machining to hole out blind spots and also to create hole in the die formation plate/ metal work plate</p> <p>PC19. Setup the electrodes of the EDM machine and measure the distance between the electrodes as mentioned in the Work Instructions/ SOPs</p> <p>PC20. Ensure that the correct current and voltage are selected for the EDM process</p> <p>PC21. Ensure that the work piece/ metal piece is carefully loaded on the EDM machine surface tables/ work platform using manual/ automatic tools</p> <p>PC22. Ensure that there is uniform flow of dielectric liquid i.e. flushing of the dielectric liquid to remove any debris which would have collected during the EDM process</p> <p>PC23. Ensure that the machine operations are regularly monitored to detect any malfunctions in machine operations or any out of tolerance machining</p> <p>PC24. Ensure that the electrode properties like surface, dimensions, metallurgical properties are periodically checked as per the checklist provided</p> <p>PC25. Ensure that the electrodes are changed in case there is a deviation from the specifications</p>
Documentation and record keeping	<p>PC26. Ensure all records related to production of tools and die is maintained in the format used by the organization/ process mentioned in the Work Instructions</p> <p>PC27. Ensure that proper data related to rejections and bad quality is separately maintained as per the internal processes</p> <p>PC28. Report any issues observed during record keeping to the supervisor in a timely Manner</p>
Knowledge and Understanding (K)	
A. Organizational Context (Knowledge of the company / organization and its processes)	<p>The user/individual on the job needs to know and understand:</p> <p>KA1. relevant standards and procedures followed in the company</p> <p>KA2. different types of products manufactured by the company</p> <p>KA3. quality management practices of the organization</p>
B. Technical Knowledge	<p>The user/individual on the job needs to know and understand:</p> <p>KB1. basic preparation process of machine and machine settings</p> <p>KB2. operations for various machining related tools</p> <p>KB3. the method of reading and interpreting the various drawings (2D, 3D and line sketches)</p> <p>KB4. knowledge of punch setting, operating presses and stoning operations</p> <p>KB5. types of jigs, fixtures and dies used in the tooling process</p> <p>KB6. usage of tri squares, geometry squares to check for perpendiculars in two joining parts</p>

ASC/N4103

Perform the tool and die manufacturing process

	<p>KB7. manufacturing processes like milling , grinding , boring, turning etc through manual/ CNC operated machines</p> <p>KB8. process related to welding and assembly of tools, fixtures and dies</p> <p>KB9. how to operate wire cut machines and EDM machines used for die making</p> <p>KB10. metallurgical properties of various metals/ alloys used for die and tool preparation</p> <p>KB11. how to use lifting tools like hoists, cranes, clamps etc.</p> <p>KB12. how to use various measuring gauges like vernier calipers, micrometers, thickness gauges, dial indicators</p> <p>KB13. Basic algebra and trigonometric rules</p> <p>KB14. how to visualize the final product output and conduct quality verification tests</p> <p>KB15. manufacturing defects associated with the machining and related processes and impact of the defects on the final product output</p>
Skills (S) [Optional]	
A. Core Skills/ Generic Skills	Writing Skills
	<p>The user/ individual on the job needs to know and understand how to:</p> <p>SA1. document information</p> <p>SA2. note down observations (if any) related to the design aspect</p> <p>SA3. write information documents to internal departments/ internal teams or enter the information in online ERP systems under guidance of the supervisor</p>
	Reading Skills
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SA4. read and interpret technical 2D drawings</p> <p>SA5. read and understand the various tolerances and specifications for the product</p> <p>SA6. read internal information documents sent by internal teams</p>
	Oral Communication (Listening and Speaking skills)
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SA7. discuss task lists, schedules and activities with the supervisor</p> <p>SA8. effectively communicate with the team members</p> <p>SA9. question the customer in order to understand the nature of the problem and to clarify queries</p> <p>SA10. attentively listen with full attention and comprehend the information given by the speaker</p>
B. Professional Skills	Plan and Organize
	<p>The user/individual on the job needs to know and understand:</p> <p>SB1. plan and organize the work order and jobs received</p> <p>SB2. plan and organize the design/ process/quality documents received from internal customers</p> <p>SB3. organize all manuals so that sorting out information is fast</p>
	Analytical Thinking
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB4. carefully analyse the 2D drawing for various customer specifications</p> <p>SB5. carefully do the manufacturing and assembly operations with relevant actions</p>

ASC/N4103

Perform the tool and die manufacturing process

	as listed in SOP/WI
	Problem Solving and Decision making
	The user/individual on the job needs to know and understand how to: SB6. detect problems in day to day tasks SB7. support supervisor in using specific problem solving techniques and detailing out the problems SB8. discuss possible solution with the supervisor for problem solving SB9. make decisions in emergency conditions in case the supervisor is not available(as per the authority matrix defined by the organization)
	Quality Consciousness
	The user/individual on the job needs to know and understand how to: SB10. identify defective parts in the manufacturing line by comparing manufactured pieces with the work standard SB11. link the defect observed with the overall impact on the performance of the component

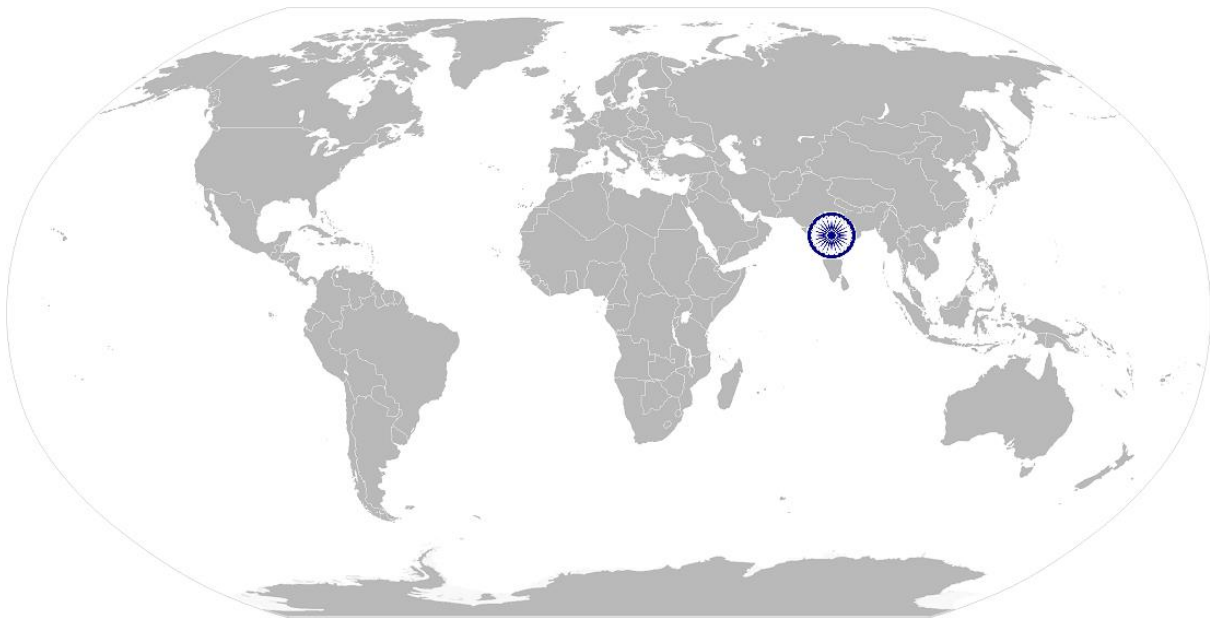
NOS Version Control

NOS Code	ASC/N4103		
Credits(NSQF)	TBD	Version number	1.0
Industry	Automotive	Drafted on	20/10/2013
Industry Sub-sector	Manufacturing	Last reviewed on	6/11/2013
Occupation	Tool Room	Next review date	Under revision expected date of revised version 31-Dec-15

ASC/N4104

Performing the Tool and Die assembly operations

National Occupational Standard



Overview

This unit is about assembling the manufactured Tool & Die as per the product specifications

ASC/N4104

Performing the Tool and Die assembly operations

National Occupational Standard

Unit Code	ASC /N4104
Unit Title (Task)	Performing the Tool and Die assembly operation
Description	This NOS is about assembling the tool/ die using various fitting and joining techniques , conducting quality inspections and fitting the tool/ die at the customer end
Scope	<p>The tool room operator will be responsible for</p> <ul style="list-style-type: none"> • using methods like bolting, riveting, fastening etc. to assemble the dies and the tools. • maintaining data of production and rejection • escalations of any queries <p>The job holder will cover tool & die manufacturing methods like machining, grinding and assembly processes like fitting, bolting, tightening for manufacturing of tools and dies. The role holder will interact with the tool designer, maintenance team and material management team</p>
Performance Criteria(PC) w.r.t. the Scope	
Element	Performance Criteria
Tool and Die Assembly	<p>PC1. Understand the assembly operations from the assembly drawing/ blue print, Work Instructions/ SOPs supplied on the assembly line</p> <p>PC2. Understand the right tools required for assembly and fabrication of the tool & die manufactured</p> <p>PC3. Ensure availability of joining parts like clamps, braces, nuts, bolts, fasteners collars etc. at the assembly platform</p> <p>PC4. Understand the correct method of the assembly operation such as angle for holding the bolting gun/ riveting gun, direction of applying torque, position of technician hand/ body to complete the assembly operation keeping in mind safe working procedures</p> <p>PC5. Read the specifications manuals and plan assembly or building operations</p> <p>PC6. Design and manufacture the jigs and fixtures for use to aid in assembly of parts</p> <p>PC7. Lift , position and secure machined parts on surface plates or worktables for assembly using appropriate equipment like hoists, chain pulleys, cranes etc</p> <p>PC8. Fit and assemble parts to make , repair or modify tools using machine tools</p> <p>PC9. Carefully insert the right bolts, screw, rivet in the required place in the part of be assembled</p> <p>PC10. Perform tightening of nuts and bolts using bolting guns/ riveting guns as per the required specifications for fitment of each part</p> <p>PC11. Ensure right amount of torque application for tightening the bolted Components</p> <p>PC12. Join components using welding and brazing processes as per the design and specifications available with the assembly team</p> <p>PC13. Ensure any extra material on the tool & die is removed using cutting tools like hacksaws, power blades, cutting torches etc.</p> <p>PC14. File, shim, grind and polish flat and contoured surface of assembled tools and dies using manual files, abrasive grinding surfaces, polishing tools (for rough polishing, fine polishing, diamond polishing and surface smoothening)</p>

ASC/N4104

Performing the Tool and Die assembly operations

	<p>PC15. Ensure verification of dimensions, clearances and alignment of parts and components as specified in the Work Instructions/ SOP, using standard measurement gauges like micrometres, vernier calipers, thickness gauges and dial indicators</p> <p>PC16. Seal any potential areas of leakage and seepage which may damage the tool or die</p> <p>PC17. Conduct regular maintenance and cleaning of assembly tools and lifting tools as per the processes mentioned in the checklist</p> <p>PC18. Ensure that any type of impurities like grease, oil, dust, rust etc. should be removed from the assembly and fabrication tools</p>
Tool and Die Inspection	<p>PC19. Conduct quality inspection of the tool for various tolerances</p> <p>PC20. Ensure that the finished dies are checked for smoothness, contour conformity and defects. Check the tools and dies in a green room in case facility is available with the operator.</p> <p>PC21. Ensure squareness checking to measure various angles in case of joining parts</p> <p>PC22. Conduct a spotting press operation including punch setting, hard pressing, and component spotting to perform real time tests on the developed tools</p> <p>PC23. Perform the nitriding operation to harden the manufacturing tool and die</p> <p>PC24. Conduct test runs as specified in the Work Instructions/ SOP manuals on assembled tools and dies to ensure conformance to the standards</p> <p>PC25. Support the team in conducting test trials of the tool at the customer end. Key customer end tests includes checking the mounting of the dies, fitment of the die in the machine slot, production of the product sample, adherence to the product dimensions as per the specifications provided by the customer</p> <p>PC26. In case of any deviations/ required changes, make changes in the tool/ die and conduct retrial of the tool at the shop floor for durability and reliability</p> <p>PC27. Send the completed tool and die for packaging and despatch to the customer</p>
Documentation and record keeping	<p>PC28. Ensure all records related to production and final assembly of tools and die is maintained in the format used by the organization/ process mentioned in the Work Instructions</p> <p>PC29. Ensure that proper data related to rejections and bad quality is separately maintained as per the internal processes</p> <p>PC30. Report any issues observed during record keeping to the supervisor in a timely Manner</p>
Knowledge and Understanding (K)	
B. Organizational Context (Knowledge of the company / organization and its processes)	<p>The user/individual on the job needs to know and understand:</p> <p>KA1. relevant standards and procedures followed in the company</p> <p>KA2. different types of products manufactured by the company</p> <p>KA3. quality management practices of the organization</p>
B. Technical Knowledge	<p>The user/individual on the job needs to know and understand:</p> <p>KB1. basic preparation process of machine and machine settings</p> <p>KB2. operations for various machining related tools</p> <p>KB3. the method of reading and interpreting the various drawings (2D, 3D and line sketches)</p>

ASC/N4104

Performing the Tool and Die assembly operations

	<p>KB4. knowledge of punch setting, operating presses and stoning operations</p> <p>KB5. types of jigs, fixtures and dies used in the tooling process</p> <p>KB6. usage of tri squares, geometry squares to check for perpendiculars in two joining parts</p> <p>KB7. manufacturing processes like milling , grinding , boring, turning etc.</p> <p>KB8. assembly processes like bolting, tightening, bending, jointing, sealing</p> <p>KB9. process related to welding and assembly of tools, fixtures and dies</p> <p>KB10. how to operate wire cut machines and EDM machines used for die making</p> <p>KB11. metallurgical properties of various metals/ alloys used for die and tool preparation</p> <p>KB12. how to use lifting tools like hoists, cranes, clamps etc.</p> <p>KB13. how to use various measuring gauges like vernier calipers, micrometers, thickness gauges, dial indicators</p> <p>KB14. how to visualize the final product output and conduct quality verification tests.</p>
Skills (S) [Optional]	
C. Core Skills/ Generic Skills	Writing Skills
	<p>The user/ individual on the job needs to know and understand how to:</p> <p>SA1. document information</p> <p>SA2. note down observations (if any) related to the design aspect</p> <p>SA3. write information documents to internal departments/ internal teams or enter the information in online ERP systems under guidance of the supervisor</p>
	Reading Skills
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SA4. read and interpret technical 2D drawings</p> <p>SA5. read and understand the various tolerances and specifications for the product</p> <p>SA6. read internal information documents sent by internal teams</p>
	Oral Communication (Listening and Speaking skills)
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SA7. discuss task lists, schedules and activities with the supervisor</p> <p>SA8. effectively communicate with the team members</p> <p>SA9. question the customer in order to understand the nature of the problem and to clarify queries</p> <p>SA10. attentively listen with full attention and comprehend the information given by the speaker</p>
D. Professional Skills	Plan and Organize
	<p>The user/individual on the job needs to know and understand:</p> <p>SB1. plan and organize the work order and jobs received</p> <p>SB2. plan and organize the design/ process/quality documents received from internal customers</p> <p>SB3. organize all manuals so that sorting out information is fast</p>
	Analytical Thinking
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB4. carefully analyse the 2D drawing for various customer specifications</p>

ASC/N4104

Performing the Tool and Die assembly operations

	SB5. carefully do the manufacturing and assembly operations with relevant actions as listed in SOP/WI
	Problem Solving and Decision making
	The user/individual on the job needs to know and understand how to: SB6. detect problems in day to day tasks SB7. support supervisor in using specific problem solving techniques and detailing out the problems SB8. discuss possible solution with the supervisor for problem solving SB9. make decisions in emergency conditions in case the supervisor is not available(as per the authority matrix defined by the organization)
	Quality Consciousness
	The user/individual on the job needs to know and understand how to: SB10. identify defective parts in the manufacturing line by comparing manufactured pieces with the work standard SB11. link the defect observed with the overall impact on the performance of the component

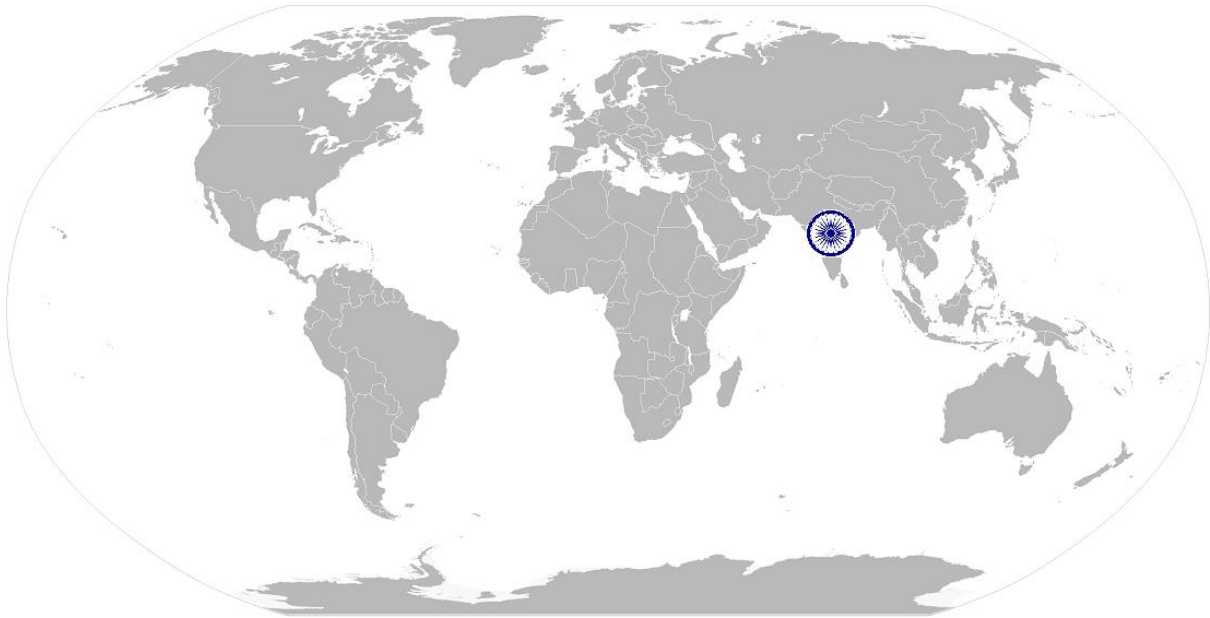
NOS Version Control

NOS Code	ASC/N4104		
Credits(NSQF)	TBD	Version number	1.0
Industry	Automotive	Drafted on	20/10/2013
Industry Sub-sector	Manufacturing	Last reviewed on	6/11/2013
Occupation	Tool Room	Next review date	Under revision expected date of revised version 31-Dec-15

ASC/N0006

Maintain a safe and healthy working environment

National Occupational Standard



Overview

This unit is about establishing a Safe, Healthy and Environment friendly workplace

ASC/N0006

Maintain a safe and healthy working environment

National Occupational Standard

Unit Code	ASC/N0006
Unit Title (Task)	Maintain a safe and healthy working environment
Description	This NOS unit is about creating a Safe and Healthy work place, adhering to the safety guidelines in the working area, following practices which are not impacting the environment in a negative manner
Scope	<p>The role holder will be responsible for</p> <ul style="list-style-type: none"> identifying and reporting of risks creating and sustaining a safe, clean and environment friendly work place <p>This NOS will be applicable to all Automotive sector manufacturing job roles</p>
Performance Criteria (PC) w.r.t. the Scope	
Element	Performance Criteria
Identify and report the risks identified	<p>PC1. Identify activities which can cause potential injury through sharp objects, burns, fall, electricity, gas leakages, radiation, poisonous fumes, chemicals, loud noise</p> <p>PC2. Conduct regular checks on machine health to identify potential hazards due to wear and tear of machine</p> <p>PC3. Inform the concerned authorities about the potential risks identified in the processes, workplace area/ layout, materials used etc</p> <p>PC4. Create awareness amongst other by sharing information on the identified risks</p>
Create and sustain a Safe, clean and environment friendly work place	<p>PC5. Follow the instructions given on the equipment manual describing the operating process of the equipment</p> <p>PC6. Follow the Safety, Health and Environment related practices developed by the organization</p> <p>PC7. Operate the machine using the recommended Personal Protective Equipment (PPE) and ensure team members also use the related PPEs at the workplace</p> <p>PC8. Maintain a clean and safe working environment near the work place and ensure there is no spillage of chemicals, production waste, oil, solvents etc.</p> <p>PC9. Attend all safety and fire drills to be self-aware of safety hazards and preventive techniques</p> <p>PC10. Maintain high standards of personal hygiene at the work place</p> <p>PC11. Ensure that the waste disposal is done in the designated area</p>

ASC/N0006

Maintain a safe and healthy working environment

	<p>and manner as per organization SOP.</p> <p>PC12. Inform appropriately the medical officer/ HR in case of self or an employee's illness of contagious nature so that preventive actions can be planned for others</p>
Knowledge and Understanding (K)w.r.t. the scope	
Element	Knowledge and Understanding
A. Organizational Context (Knowledge of the company / organization and its processes)	<p>The user/individual on the job needs to know and understand:</p> <p>KA1. relevant standards, procedures and policies related to Health, Safety and Environment followed in the company</p> <p>KA2. emergency handling procedures & hierarchy for escalation</p>
B. Technical Knowledge	<p>The user/individual on the job needs to know and understand:</p> <p>KB1. basic knowledge of Safety procedures(fire fighting, first aid) within the organization</p> <p>KB2. basic knowledge of various types of PPEs and their usage</p> <p>KB3. basic knowledge of risks/hazards associated with each occupation in the organization</p> <p>KB4. knowledge of personal hygiene and how an individual can contribute towards creating a highly safe and clean working environment</p>
Skills (S)w.r.t. the scope	
Element	Skills
A. Core Skills/ Generic Skills	Writing Skills
	<p>The user/ individual on the job needs to know and understand how to:</p> <p>SA1. write basic level notes and observations</p>
	Reading Skills
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SA2. read safety instructions put up across the plant premises</p> <p>SA3. read safety precautions mentioned in equipment manuals and panels to understand the potential risks associated</p>
	Oral Communication (Listening and Speaking skills)
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SA4. effectively communicate information to team members</p> <p>SA5. Inform employees in the plant and concerned functions about events, incidents & potential risks observed related to Safety, Health and Environment.</p> <p>SA6. question operator/ supervisor in order to understand the safety related issues</p> <p>SA7. attentively listen with full attention and comprehend the information given by the speaker during safety drills and training programs</p>

ASC/N0006

Maintain a safe and healthy working environment

B. Professional Skills	Judgmental Thinking
	The user/individual on the job needs to know and understand how to: SB1. use common sense and make judgments during day to day basis SB2. use reasoning skills to identify and resolve basic problems

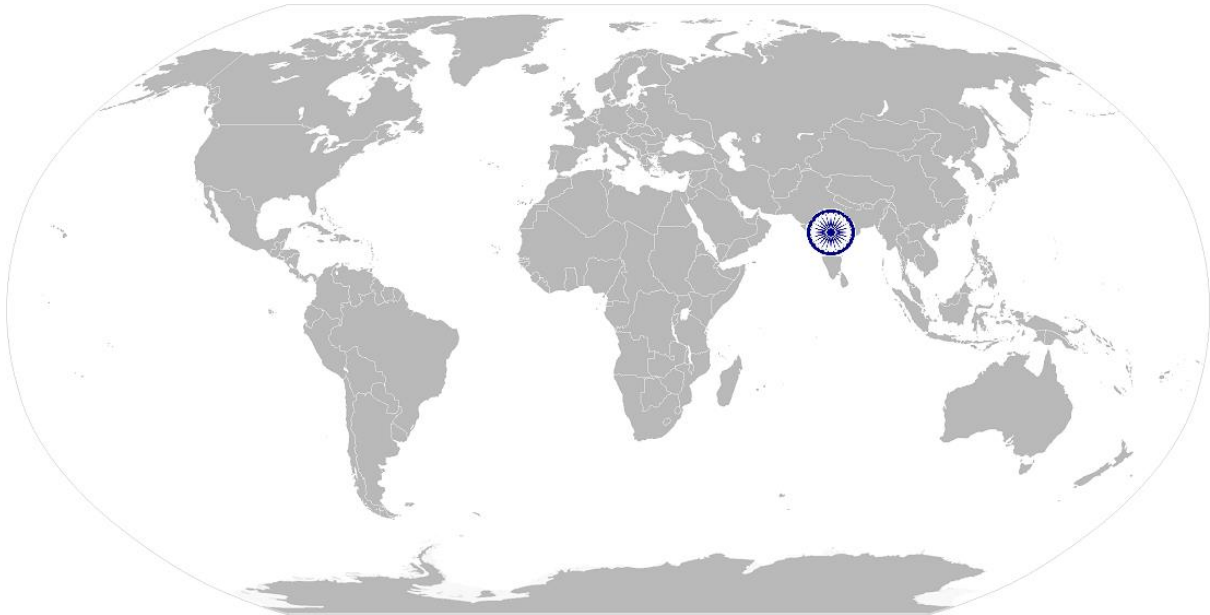
NOS Version Control

NOS Code	ASC/N0006		
Credits(NSQF)	TBD	Version number	1.0
Industry	Automotive	Drafted on	15/8/2013
Industry Sub-sector	Manufacturing	Last reviewed on	25/8/2013
Occupation	Tool Room	Next review date	Under revision expected date of revised version 31-Dec-15

ASC/N0021

Maintaining 5S at the work premises

National Occupational Standard



Overview

This unit is about the understanding all principles of 5S and follow the given guidelines to ensure a clean and efficient working environment in the organization

ASC/N0021

Maintaining 5S at the work premises

National Occupational Standard

Unit Code	ASC/N0021
Unit Title (Task)	Maintaining 5S at the work premises
Description	This NOS is about ensuring all 5 S activities both at the shop floor and the office area to facilitate increase in work productivity
Scope	<p>The individual needs to</p> <ul style="list-style-type: none"> Ensure sorting, streamlining & organizing, storage and documentation, cleaning, standardization and sustenance across the plant and office premises of the organization
Performance Criteria (PC) w.r.t. the Scope	
Element	Performance Criteria
Ensure sorting	<p>PC1. Follow the sorting process and check that the tools, fixtures & jigs that are lying on workstations are the ones in use and unnecessary items are not cluttering the workbenches or work surfaces.</p> <p>PC2. Ensure segregation of waste in hazardous/ non Hazardous waste as per the sorting work instructions</p> <p>PC3. Follow the technique of waste disposal and waste storage in the proper bins as per SOP</p> <p>PC4. Segregate the items which are labeled as red tag items for the process area and keep them in the correct places</p> <p>PC5. Sort the tools/ equipment/ fasteners/ spare parts as per specifications/ utility into proper trays, cabinets, lockers as mentioned in the 5S guidelines/ work instructions</p> <p>PC6. Ensure that areas of material storage areas are not overflowing</p> <p>PC7. Properly stack the various types of boxes and containers as per the size/ utility to avoid any fall of items/ breakage and also enable easy sorting when required</p> <p>PC8. Return the extra material and tools to the designated sections and make sure that no additional material/ tool is lying near the work area</p> <p>PC9. Follow the floor markings/ area markings used for demarcating the various sections in the plant as per the prescribed instructions and standards</p>
Ensure proper documentation and storage (organizing, streamlining)	<p>PC10. Follow the proper labeling mechanism of instruments/ boxes/ containers and maintaining reference files/ documents with the codes and the lists</p> <p>PC11. Check that the items in the respective areas have been identified as</p>

ASC/N0021

Maintaining 5S at the work premises

	<p>broken or damaged</p> <p>PC12. Follow the given instructions and check for labeling of fluids, oils, lubricants, solvents, chemicals etc. and proper storage of the same to avoid spillage, leakage, fire etc.</p> <p>PC13. Make sure that all material and tools are stored in the designated places and in the manner indicated in the 5S instructions</p>
Ensure cleaning of self and the work place	<p>PC14. Check whether safety glasses are clean and in good condition</p> <p>PC15. Keep all outside surfaces of recycling containers are clean</p> <p>PC16. Ensure that the area has floors swept, machinery clean and generally clean. In case of cleaning, ensure that proper displays are maintained on the floor which indicate potential safety hazards</p> <p>PC17. Check whether all hoses, cabling & wires are clean, in good condition and clamped to avoid any mishap or mix up</p> <p>PC18. Ensure workbenches and work surfaces are clean and in good condition</p> <p>PC19. Follow the cleaning schedule for the lighting system to ensure proper illumination</p> <p>PC20. Store the cleaning material and equipment in the correct location and in good condition</p> <p>PC21. Ensure self-cleanliness - clean uniform, clean shoes, clean gloves, clean helmets, personal hygiene</p>
Ensure sustenance	<p>PC1. Follow the daily cleaning standards and schedules to create a clean working environment</p> <p>PC2. Attend all training programs for employees on 5 S</p> <p>PC3. Support the team during the audit of 5 S</p> <p>PC4. Participate actively in employee work groups on 5S and encourage team members for active participation</p> <p>PC5. Follow the guidelines for What to do and What not to do to build sustainability in 5S as mentioned in the 5S check lists/ work instructions</p>
Knowledge and Understanding (K) w.r.t. the scope	
Element	Knowledge and Understanding
C. Organizational Context (Knowledge of the company / organization and its processes)	<p>The user/individual on the job needs to know and understand:</p> <p>KA3. relevant standards, procedures and policies related to 5S followed in the company</p>
D. Technical Knowledge	<p>The user/individual on the job needs to :</p> <p>KB5. have basic knowledge of 5S procedures</p> <p>KB6. know various types 5s practices followed in various areas</p> <p>KB7. understand the 5S checklists provided in the department/ team</p> <p>KB8. have skills to identify useful & non useful items</p> <p>KB9. have knowledge of labels , signs & colours used as indicators</p>

ASC/N0021

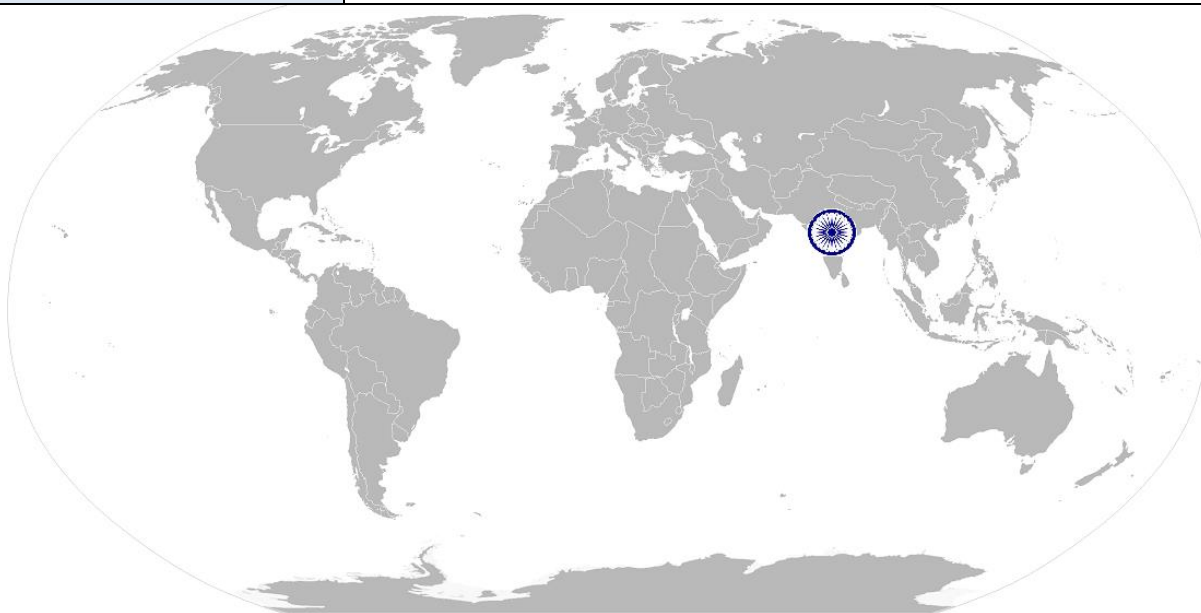
Maintaining 5S at the work premises

	<p>KB10. Have knowledge on how to sort and store various types of tools, equipment, material etc.</p> <p>KB11. know , how to identify various types of waste products</p> <p>KB12. understand the impact of waste/ dirt/ dust/unwanted substances on the process/ environment/ machinery/ human body</p> <p>KB13. have knowledge of best ways of cleaning & waste disposal</p> <p>KB14. understand the importance of standardization in processes</p> <p>KB15. understand the importance of sustainability in 5S</p> <p>KB16. have knowledge of TQM process</p> <p>KB17. have knowledge of various materials and storage norms</p> <p>KB18. understand visual controls, symbols, graphs etc.</p>
Skills (S)w.r.t. the scope	
Element	Skills
A. Core Skills/ Generic Skills	Writing Skills
	<p>The user/ individual on the job needs to know and understand how to:</p> <p>SA8. write basic level notes and observations</p> <p>SA9. note down observations (if any) related to the process</p> <p>SA10. write information documents to internal departments/ internal teams</p>
	Reading Skills
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SA11. read 5S instructions put up across the plant premises</p>
	Oral Communication (Listening and Speaking skills)
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SA12. effectively communicate information to team members inform employees in the plant and concerned functions about 5S</p> <p>SA13. question the process head in order to understand the 5S related issues</p> <p>SA14. attentively listen with full attention and comprehend the information given by the speaker during 5S training programs</p>
B. Professional Skills	Judgmental Thinking
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB3. use common sense and make judgments during day to day basis</p> <p>SB4. use reasoning skills to identify and resolve basic problems using 5S</p>
	Persuasion
	<p>The user/ individual on the jobs needs to know and understand how to:</p> <p>SB5. persuade co team members to follow 5 S</p> <p>SB6. ensure that the co team members understand the importance of using 5 S tool</p>

ASC/N0021

Maintaining 5S at the work premises

	Creativity
	The user/individual on the job needs to know and understand how to : SB7. use innovative skills to perform and manage 5 S activities at the work desk and the shop floor SB8. exhibit inquisitive behaviour to seek feedback and question on the existing set patterns of work
	Self –Discipline
	The user/individual on the job needs to know and understand how to: SB9. do what is right, not what is a popular practices SB10. follow shop floor rules& regulations and avoid deviations; make 5S an integral way of life SB11. ensure self-cleanliness on a daily basis SB12. demonstrate the will to keep the work area in a clean and orderly manner



ASC/N0021

Maintaining 5S at the work premises

NOS Version Control

NOS Code	ASC/N0021		
Credits(NSQF)	TBD	Version number	1.0
Industry	Automotive	Drafted on	1/03/2014
Industry Sub-sector	Manufacturing/ R&D	Last reviewed on	15/03/2014
Occupation	Tool Room	Next review date	Under revision expected date of revised version 31-Dec-15

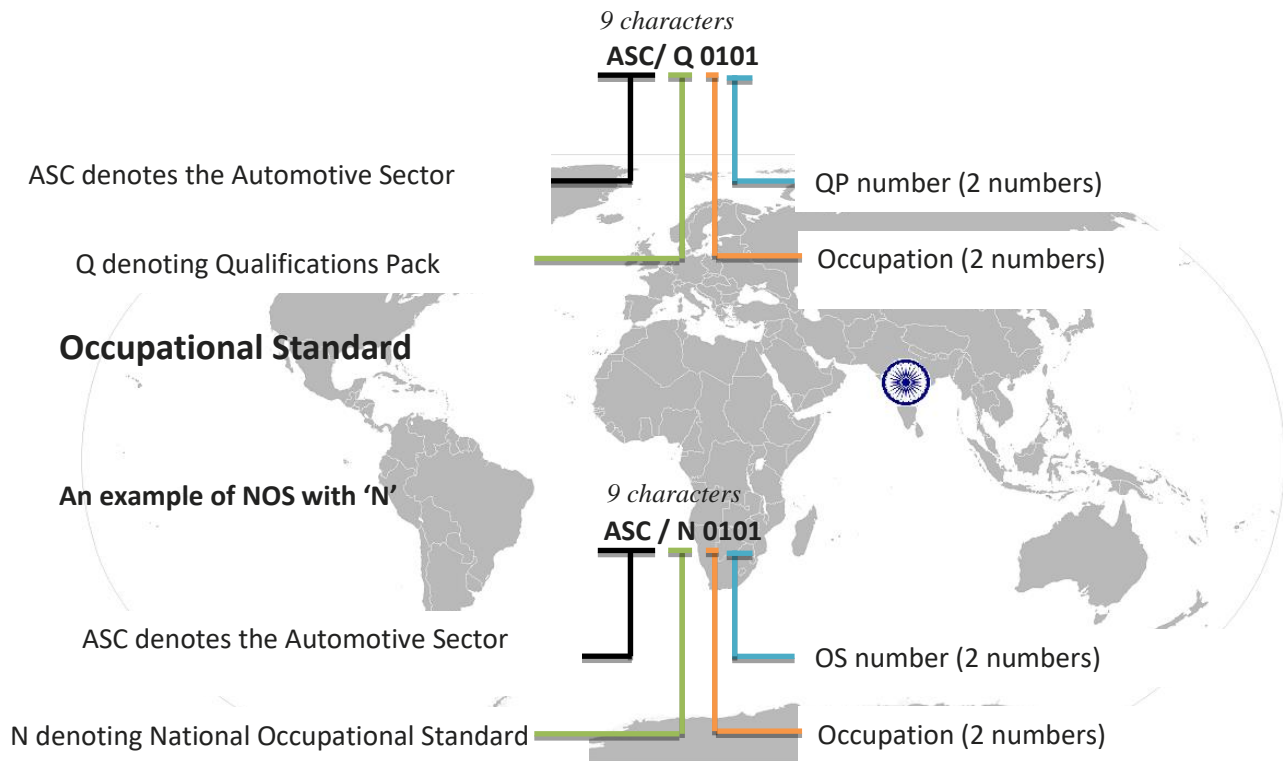


ASC/N0021

Maintaining 5S at the work premises

Annexure

Qualifications Pack



[Back to top...](#)

ASC/N0021

Maintaining 5S at the work premises

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

Sub-sector	Range of Occupation numbers
Manufacturing	31 - 45 & 61 - 68
Research & Development	81 - 84
Sales & Service	01 - 21
Road Transportation	96 - 97

Sequence	Description	Example
Three letters	Automotive	ASC
Slash	/	/
Next letter	Whether QP or NOS	N
Next two numbers	Occupation code	10
Next two numbers	OS number	12

Qualification Pack for Tool Room Operator /Technician

Criteria for assessment of Trainees

JOB ROLE	Tool Room Operator OR Technician
Qualification Pack	ASC/Q 4101
No. Of NOS	4 Role specific ,2 generic

Sr. No.	Guidelines for Assessment
1	Assessment to be conducted by ASDC as per competency output defined in the NOS/QP and the assessment criteria provided in the NOS/QP
2	Assessment to be carried out by a third party Assessment Body duly affiliated to the SSC.
3	ASDC assessments will be comprehensive and cover all aspects of acquired knowledge, practical skills and also basic ability to communicate. Accordingly, evaluation process would include: <ul style="list-style-type: none"> i. Theory/Knowledge test ii. Practical demonstration test iii. Face to Face Viva-Voice
4	Theory/Knowledge assessment will be carried out on line through a link provided for each assessment that generates a random paper from a bank of questions available at the back end. <ul style="list-style-type: none"> • Exception to an online test in favour of Paper Test would be subject to non availability of requisite broad band and/or hardware. • On line test would be conducted in the presence of an ASDC assessor till web enabled proctoring is deployed.
5	ASDC assessor would be conducting Practical and Viva as per the criteria provided in the NOS/QP.
6	Cut off criteria for certification (Marks obtained in: 70%)

Assessable Outcome	Assessment Criteria	Total Mark	Out of	Marks allocation	
				Theory	Practical
1. ASC/N4101 Understand the process & equipment requirements to carry out the task	PC1. Ensure that all the drawings, sketches and models are understood at the beginning of the process to finalize the operations to be performed by the operator	100	7	2	5
	PC2. Ensure accurate understanding of the Geometric Dimensions and Tolerance before initiating the tool and die making process		7	2	5

Qualification Pack for Tool Room Operator /Technician

PC3. Understand the right machining & assembling methodology and process to be adopted for completing the work order through discussions with the supervisor/master technician and reading the process manuals/ Work Instructions/Standard Operating Procedures	7	2	5
PC4. Understand the various machining processes (manual as well as on CNC) like grinding, tapering, milling, boring, cutting etc. which will be required during the tool making and die making process	7	2	5
PC5. Understand the material required and the equipment availability for executing the activity	10	3	7
PC6. Understand the various assembling process parameters like cycle time, fitting tolerances, torque application, bolting and fastening before starting the assembling process, as mentioned in the Work Instructions/ SOP manual	12	4	8
PC7. Understand 5S related to the work station and line area	12	4	8
PC8. Clearly understanding the does and don'ts of the manufacturing process as defined in SOPs/ Work Instructions or defined by supervisors	10	3	7
PC9. In case while understanding the drawings and sketches some problems are observed, ensure that they are highlighted to the design team	7	2	5
PC10. Refer the queries to a competent internal specialist if they cannot be resolved by the operator on own	7	2	5
PC11. Obtain help or advice from specialist if the problem is outside	7	2	5

Qualification Pack for Tool Room Operator /Technician

	his/her area of competence or experience				
	PC12. Confirm self-understanding with the specialist holding discussions so that all doubts & queries can be resolved before the actual process execution		7	2	5
	Total		100	30	70
2. ASC/N4102 Prepare the machine, auxiliaries & work pieces	PC1. Understand the material required and the equipment availability for executing the activity	100	7	2	5
	PC2. Ensure that the related engineering drawings and sketches are available before starting the tool & die manufacturing process		7	2	5
	PC3. Ensure that the required material is procured from the store before starting the machining process		7	2	5
	PC4. Ensure that the helper/ assistant technician brings the required material and tools before the start of the assembling operations		11	3	8
	PC5. Ensure that the machines like grinders, lather machines, CNC operator wire cut and EDM machines and tools like Bolting guns, rivet guns, nuts, bolts, screw drivers, wrenches, hacksaws, hammers etc. required for Tool & Die manufacturing and assembly are available for operations		12	4	8
	PC6. Ensure that the correct machine specifications are set in the machine before the start of operation		12	4	8
	PC7. Ensure that the helper/ assistant operator cleans the surface of the machines (Wire Cutting/ EDM/ Assembly tools) to remove dust and any other impurities like grease, oil, paint etc.		12	4	8
	PC8. Ensure that the assembly apparatus		11	3	8

Qualification Pack for Tool Room Operator /Technician

	is setup as per the selected assembling process and the internal SOPs/ Work Instructions and the setting standards for the machine				
	PC9. Ensure that the calibration of the manufacturing tools and measuring tools is accurate		7	2	5
	PC10. Immediately refer the queries to the supervisor to avoid any delay in the actual process		7	2	5
	PC11. Confirm self-understanding to the supervisor/ master technician during the discussions so that all doubts & queries can be resolved before the actual process execution		7	2	5
	Total		100	30	70
3. ASC/N4103 Perform tool & die manufacturing activities	PC1. Ensure that the operator receives the 2D drawing from the design team	100	3	1	2
	PC2. Study the drawings/ sketches to understand the operations to be performed by the operator/ machinist and plan sequences of operations for fabricating tools, dies or assemblies		3	1	2
	PC3. Select metals to be used based on properties like hardness and tolerance for forming the tool		3	1	2
	PC4. Measure and mark the metal to lay out machining using instruments such as protractors or micrometres		3	1	2
	PC5. Lift the work pieces/ metal blocks on the working platform using appropriate lifting tools like hoists, cranes, chain pulley, angle plates		3	1	2
	PC6. Ensure that the work pieces are sized as per the requirement using power operated/ manual/ automatic cutting tools like hacksaws, sawing blades		3	1	2
	PC7. Conduct Rough machining for initial block sizing. Ensure that the		3	1	2

Qualification Pack for Tool Room Operator /Technician

	block is properly bolted on the machining block and machining activities are carried out as per the product requirement				
	PC8. Operate CNC machines like lathes, milling machines, boring machines and grinders to cut, bore, grind the material to achieve the prescribed shape and dimension		3	1	2
	PC9. Ensure that the right program is selected for operating the CNC machine tools		3	1	2
	PC10. In case of manual tools, ensure correct setting of drill presses, boring tools, hacksaws, grinders as per the process requirement mentioned in the Work Instructions/ SOP manuals		3	1	2
	PC11. Cut , shape and trim blanks to specified lengths or shapes using the CNC machines		4	1	3
	PC12. Use wire cutting and Vertical Machining Centre technique to cut the blocks into separate pieces		4	1	3
	PC13. Ensure that the metal block is properly loaded on the VMC machine to mill the block as per requirement		4	1	3
	PC14. Ensure that the machine operations are regularly monitored to detect any malfunctions in machine operations or any out of tolerance machining		4	1	3
	PC15. Verify the conformance of the output product to the specifications mentioned in the Work Instructions/ SOPs using precision measurement tools		4	1	3
	PC16. Ensure that routine maintenance activities are carried out by the operator as per the checklist provided by the maintenance team		6	2	4

Qualification Pack for Tool Room Operator /Technician

	PC17. Ensure that any impurities like grease, oil, dust, rust etc. is periodically cleaned from the machining equipment		4	1	3
	PC18. Use Electric Discharge Machining to hole out blind spots and also to create hole in the die formation plate/ metal work plate		6	2	4
	PC19. Setup the electrodes of the EDM machine and measure the distance between the electrodes as mentioned in the Work Instructions/ SOPs		4	1	3
	PC20. Ensure that the correct current and voltage are selected for the EDM process		4	1	3
	PC21. Ensure that the work piece/ metal piece is carefully loaded on the EDM machine surface tables/ work platform using manual/ automatic tools		4	1	3
	PC22. Ensure that there is uniform flow of dielectric liquid i.e. flushing of the dielectric liquid to remove any debris which would have collected during the EDM process		4	1	3
	PC23. Ensure that the machine operations are regularly monitored to detect any malfunctions in machine operations or any out of tolerance machining		3	1	2
	PC24. Ensure that the electrode properties like surface, dimensions, metallurgical properties are periodically checked as per the checklist provided		3	1	2
	PC25. Ensure that the electrodes are changed in case there is a deviation from the specifications		3	1	2
	PC26. Ensure all records related to production of tools and die is maintained in the format used by		3	1	2

Qualification Pack for Tool Room Operator /Technician

	the organization/ process mentioned in the Work Instructions				
	PC27. Ensure that proper data related to rejections and bad quality is separately maintained as per the internal processes		3	1	2
	PC28. Report any issues observed during record keeping to the supervisor in a timely manner		3	1	2
	Total		100	30	70
4. ASC/N4104 Perform Tool / Die assembly operation	PC1. Understand the assembly operations from the assembly drawing/ blue print, Work Instructions/ SOPs supplied on the assembly line	100	3	1	2
	PC2. Understand the right tools required for assembly and fabrication of the tool & die manufactured		3	1	2
	PC3. Ensure availability of joining parts like clamps, braces, nuts, bolts, fasteners collars etc. at the assembly platform		3	1	2
	PC4. Understand the correct method of the assembly operation such as angle for holding the bolting gun/ riveting gun, direction of applying torque, position of technician hand/ body to complete the assembly operation keeping in mind safe working procedures		3	1	2
	PC5. Read the specifications manuals and plan assembly or building operations		3	1	2
	PC6. Design and manufacture the jigs and fixtures for use to aid in assembly of parts		3	1	2
	PC7. Lift, position and secure machined parts on surface plates or worktables for assembly using appropriate equipment like hoists, chain pulleys, cranes etc		3	1	2
	PC8. Fit and assemble parts to make, repair or modify tools using machine tools		3	1	2
	PC9. Carefully insert the right bolts, screw, rivet in the required place in the part to be assembled		3	1	2
	PC10. Perform tightening of nuts and bolts using bolting guns/ riveting guns as per the required specifications for fitment of each part		3	1	2
	PC11. Ensure right amount of torque		4	1	3

Qualification Pack for Tool Room Operator /Technician

	application for tightening the bolted Components				
	PC12. Join components using welding and brazing processes as per the design and specifications available with the assembly team		4	1	3
	PC13. Ensure any extra material on the tool & die is removed using cutting tools like hacksaws, power blades, cutting torches etc.		4	1	3
	PC14. File, shim, grind and polish flat and contoured surface of assembled tools and dies using manual files, abrasive grinding surfaces, polishing tools (for rough polishing, fine polishing, diamond polishing and surface smoothening)		4	1	3
	PC15. Ensure verification of dimensions, clearances and alignment of parts and components as specified in the Work Instructions/ SOP, using standard measurement gauges like micrometres, vernier calipers, thickness gauges and dial indicators		4	1	3
	PC16. Seal any potential areas of leakage and seepage which may damage the tool or die		4	1	3
	PC17. Conduct regular maintenance and cleaning of assembly tools and lifting tools as per the processes mentioned in the checklist		4	1	3
	PC18. Ensure that any type of impurities like grease, oil, dust, rust etc. should be removed from the assembly and fabrication tools		5	2	3
	PC19. Conduct quality inspection of the tool for various tolerances		4	1	3
	PC20. Ensure that the finished dies are checked for smoothness, contour conformity and defects. Check the tools and dies in a green room in case facility is available with the operator.		4	1	3
	PC21. Ensure squareness checking to measure various angles in case of joining parts		4	1	3
	PC22. Conduct a spotting press operation including punch setting, hard pressing, and component spotting to perform real time tests on the developed tools		4	1	3
	PC23. Perform the nitriding operation to		3	1	2

Qualification Pack for Tool Room Operator /Technician

	harden the manufacturing tool and die Conduct test runs as specified in the Work Instructions/ SOP manuals on assembled tools and dies to ensure conformance to the standards				
	PC24. Support the team in conducting test trials of the tool at the customer end. Key customer end tests includes checking the mounting of the dies, fitment of the die in the machine slot, production of the product sample, adherence to the product dimensions as per the specifications provided by the customer		3	1	2
	PC25. In case of any deviations/ required changes, make changes in the tool/ die and conduct retrieval of the tool at the shop floor for durability and reliability		3	1	2
	PC26. Send the completed tool and die for packaging and despatch to the customer		3	1	2
	PC27. Ensure all records related to production and final assembly of tools and die is maintained in the format used by the organization/ process mentioned in the Work Instructions		3	1	2
	PC28. Ensure that proper data related to rejections and bad quality is separately maintained as per the internal processes		3	1	2
	PC29. Report any issues observed during record keeping to the supervisor in a timely manner		3	1	2
	Total		100	30	70
5. ASC/N0006 Maintain a safe and healthy working environment	PC1. Identify and prevent activities which can cause potential injury through sharp objects, burns, fall, electricity, gas leakages, radiation, poisonous fumes, chemicals, loud noise.	100	7	2	5
	PC2. Inform the concerned authorities about the potential risks identified in the processes, workplace area/ layout, materials used etc.		7	2	5
	PC3. Inform the concerned authorities about damages which can potentially harm man/ machine during operations		7	2	5
	PC4. Create awareness amongst other by sharing information on the identified risks.		11	3	8

Qualification Pack for Tool Room Operator /Technician

	PC5. Follow the instructions given on the equipment manual describing the operating process of the equipment.		12	4	8
	PC6. Follow the Safety, Health and Environment related practices developed by the organization.		12	4	8
	PC7. Operate the machine using the recommended Personal Protective Equipment (PPE)		12	4	8
	PC8. Maintain a clean and safe working environment near the workplace and ensure there is no spillage of chemicals, production waste, oil, solvents etc.		11	3	8
	PC9. Maintain high standards of personal hygiene at the work place.		7	2	5
	PC10. Ensure that the waste disposal takes place in the designated area as per organization SOP.		7	2	5
	PC11. Inform the medical officer/ HR in case of self or an employee's illness of contagious nature so that preventive actions can be planned for others.		7	2	5
	Total		100	30	70
6. ASC/N0021 Maintain 5S at the work premises	PC1. Follow the sorting process and check that the tools, fixtures & jigs that are lying on workstations are the ones in use and un-necessary items are not cluttering the workbenches or work surfaces.	100	3	1	2
	PC2. Ensure segregation of waste in hazardous/ non Hazardous waste as per the sorting work instructions.		3	1	2
	PC3. Follow the technique of waste disposal and waste storage in the proper bins as per SOP.		3	1	2
	PC4. Segregate the items which are labeled as red tag items for the process area and keep them in the correct places.		4	1	3
	PC5. Sort the tools/ equipment/ fasteners/ spare parts as per specifications/ utility into proper trays, cabinets, lockers as mentioned in the 5S guidelines/ work instructions.		4	1	3
	PC6. Ensure that areas of material		4	1	3

Qualification Pack for Tool Room Operator /Technician

	storage areas are not overflowing.			
	PC7. Properly stack the various types of boxes and containers as per the size/ utility to avoid any fall of items/ breakage and also enable easy sorting when required.	4	1	3
	PC8. Return the extra material and tools to the designated sections and make sure that no additional material/ tool is lying near the work area.	4	1	3
	PC9. Follow the floor markings/ area markings used for demarcating the various sections in the plant as per the prescribed instructions and standards.	4	1	3
	PC10. Ensure proper labeling mechanism of instruments/ boxes/ containers and maintaining reference files/ documents with the codes and the lists.	4	1	3
	PC11. Check that the items in the respective areas have been identified as broken or damaged	4	1	3
	PC12. Follow the given instructions and check for labeling of fluids, oils. Lubricants, solvents, chemicals etc. And proper storage of the same to avoid spillage, leakage, fire etc.	4	1	3
	PC13. Make sure that all material and tools are stored in the designated places and in the manner indicated in the 5S instructions.	4	1	3
	PC14. Check whether safety glasses are clean and in good condition.	4	1	3
	PC15. Keep all outside surfaces of recycling containers are clean	4	1	3
	PC16. Ensure that the area has floors swept, machinery clean and generally clean. In case of cleaning, ensure that proper displays are maintained on the floor which indicate potential safety hazards	4	1	3
	PC17. Check whether all hoses, cabling &	4	1	3

Qualification Pack for Tool Room Operator /Technician

	wires are clean, in good condition and clamped to avoid any mishap or mix up.				
	PC18.Ensure workbenches and work surfaces are clean and in good condition.		4	1	3
	PC19.Follow the cleaning schedule for the lighting system to ensure proper illumination.		4	1	3
	PC20.Store the cleaning material and equipment in the correct location and in good condition.		4	1	3
	PC21.Ensure self-cleanliness - clean uniform, clean shoes, clean gloves, clean helmets, personal hygiene.		4	1	3
	PC22. Follow the daily cleaning standards and schedules to create a clean working environment.		3	1	2
	PC23. Attend all training programs for employees on 5S.		3	1	2
	PC24. Support the team during the audit of 5S.		3	1	2
	PC25. Participate actively in employee work groups on 5S and encourage team members for active participation.		3	1	2
	PC26. Follow the guidelines for What to do and What not to do to build sustainability in 5S as mentioned in the 5S check lists/ work instructions.		3	1	2
	Total		100	30	70
	Grand Total	600	600	180	420
	Percentage Weightage (%)			30	70