

## Qualification Pack



# Tool Room Designer

QP Code: ASC/Q4001

Version: 1.0

NSQF Level: 5

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## Qualification Pack

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## Qualification Pack

### ASC/Q4001: Tool Room Designer

#### Brief Job Description

Tool room designer has to interpret the customer requirement of tools and simulate the same using 3D and 2D drawings through various computer aided design tools to create a graphical model on exact specifications for the Manufacturing and R&D of Tool and Die.

#### Personal Attributes

The individual should be detailed oriented, observant; should be good in computing skills and analysis. The individual should be able to visualize the final output, should be creative in designing components and parts for the tools and die and be able to communicate well with the customers ( internal and external). Should have a good vision and should not be colour blind.

#### Applicable National Occupational Standards (NOS)

##### Compulsory NOS:

- [1. ASC/N0006: Maintain a safe and healthy working environment](#)
- [2. ASC/N0022: Ensure implementation of 5S activities at the shop floor & the office area](#)
- [3. ASC/N4001: Understand processes and equipment requirement for designing tools and dies .](#)
- [4. ASC/N4002: Performing the tool and die designing Operation](#)

#### Qualification Pack (QP) Parameters

<b>Sector</b>	Automotive
<b>Sub-Sector</b>	Manufacturing
<b>Occupation</b>	Tool Room
<b>Country</b>	India
<b>NSQF Level</b>	5
<b>Aligned to NCO/ISCO/ISIC Code</b>	NCO-2015/3115.1200
<b>Minimum Educational Qualification &amp; Experience</b>	Diploma (Mechanical Engineering with certification in CAD/CAM) with 3-5 Years of experience in tool room
<b>Minimum Level of Education for Training in School</b>	

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<b>Pre-Requisite License or Training</b>	CAD/CAM Software modules Problem solving skills Quality Management 5S and Safety
<b>Minimum Job Entry Age</b>	18 Years
<b>Last Reviewed On</b>	06/11/2013
<b>Next Review Date</b>	30/06/2020
<b>Deactivation Date</b>	30/06/2020
<b>NSQC Approval Date</b>	28/09/2015
<b>Version</b>	1.0

## Qualification Pack

### ASC/N0006: Maintain a safe and healthy working environment

#### Description

This NOS 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 and training team members on health and safety related issues

#### Scope

The role holder will be responsible for identifying and reporting of risks creating and sustaining a safe, clean and environment friendly work place This NOS will be applicable to all Automotive sector manufacturing job roles

#### Elements and Performance Criteria

##### *Identify and report the risks identified*

To be competent, the user/individual on the job must be able to:

- PC1..** Identify activities which can cause potential injury through sharp objects, burns, fall, electricity, gas leakages, radiation, poisonous fumes, chemicals ,loud noise
- PC2.** Inform the concerned authorities about the potential risks identified in the processes, workplace area/ layout, materials used etc
- PC3.** Inform the concerned authorities about machine breakdowns, damages which can potentially harm man/ machine during operations
- PC4.** Create awareness amongst other by sharing information on the identified risks

##### *Create and sustain a Safe, clean and environment friendly work place*

To be competent, the user/individual on the job must be able to:

- PC5..** Follow the instructions given on the equipment manual describing the operating process of the equipments
- PC6..** Follow the Safety, Health and Environment related practices developed by the organization
- PC7.** Operate the machine using the recommended Personal Protective Equipments (PPE)
- 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
- PC9.** Maintain high standards of personal hygiene at the work place
- PC10.** Ensure that the waste disposal is done in the designated area and manner as per organization SOP.
- PC11.** Inform appropriately the medical officer/ HR in case of self or an employees illness of contagious nature so that preventive actions can be planned for others

#### Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** relevant standards, procedures and policies related to Health, Safety and Environment followed in the company

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- KU2.** basic knowledge of Safety procedures( fire fighting, first aid) within the organization
- KU3.** knowledge of various types of PPEs and their usage
- KU4.** basic knowledge of risks/hazards associated with each occupation in the organization
- KU5.** how to safely operate various tools and machines and risks associated with the tools/ equipment
- KU6.** knowledge of personal hygiene and how an individual can contribute towards creating a highly safe and clean working environment

## Generic Skills (GS)

User/individual on the job needs to know how to:

- GS1.** write basic level notes and observations
- GS2.** read safety instructions put up across the plant premises
- GS3.** read safety precautions mentioned in equipment manuals and panels to understand the potential risks associated
- GS4.** effectively communicate information to team members
- GS5.** inform employees in the plant and concerned functions about events, incidents & potential risks observed related to Safety, Health and Environment.
- GS6.** question operator/ supervisor in order to understand the safety related issues
- GS7.** attentively listen with full attention and comprehend the information given by the speaker during safety drills and training programs
- GS8.** use common sense and make judgments during day to day basis
- GS9.** use reasoning skills to identify and resolve basic problems
- GS10.** use common sense and make judgments during day to day basis
- GS11.** use reasoning skills to identify and resolve basic problems

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### Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Identify and report the risks identified</i>	<b>8</b>	<b>23</b>	-	-
<b>PC1..</b> Identify activities which can cause potential injury through sharp objects, burns, fall, electricity, gas leakages, radiation, poisonous fumes, chemicals ,loud noise	3	6	-	-
<b>PC2.</b> Inform the concerned authorities about the potential risks identified in the processes, workplace area/ layout, materials used etc	2	6	-	-
<b>PC3.</b> Inform the concerned authorities about machine breakdowns, damages which can potentially harm man/ machine during operations	2	6	-	-
<b>PC4.</b> Create awareness amongst other by sharing information on the identified risks	1	5	-	-
<i>Create and sustain a Safe, clean and environment friendly work place</i>	<b>17</b>	<b>52</b>	-	-
<b>PC5..</b> Follow the instructions given on the equipment manual describing the operating process of the equipments	3	7	-	-
<b>PC6..</b> Follow the Safety, Health and Environment related practices developed by the organization	3	8	-	-
<b>PC7.</b> Operate the machine using the recommended Personal Protective Equipments (PPE)	3	8	-	-
<b>PC8. .</b> Maintain a clean and safe working environment near the work place and ensure there is no spillage of chemicals, production waste, oil, solvents etc	2	8	-	-
<b>PC9.</b> Maintain high standards of personal hygiene at the work place	2	7	-	-
<b>PC10.</b> Ensure that the waste disposal is done in the designated area and manner as per organization SOP.	3	8	-	-

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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<b>PC11.</b> Inform appropriately the medical officer/ HR in case of self or an employees illness of contagious nature so that preventive actions can be planned for others	1	6	-	-
<b>NOS Total</b>	<b>25</b>	<b>75</b>	-	-

## Qualification Pack

### National Occupational Standards (NOS) Parameters

<b>NOS Code</b>	ASC/N0006
<b>NOS Name</b>	Maintain a safe and healthy working environment
<b>Sector</b>	Automotive
<b>Sub-Sector</b>	Manufacturing
<b>Occupation</b>	Maintenance
<b>NSQF Level</b>	4
<b>Credits</b>	TBD
<b>Version</b>	1.0
<b>Last Reviewed Date</b>	15/09/2013
<b>Next Review Date</b>	15/09/2015
<b>NSQC Clearance Date</b>	20/07/2015

## Qualification Pack

# ASC/N0022: Ensure implementation of 5S activities at the shop floor & the office area

## Description

This NOS is about overseeing the implementation of all 5 S activities both at the shop floor and the office area by the team members and training the team in implementation of the 5S principles

## Scope

The individual needs to Ensure sorting, streamlining/ organizing, storage and documentation, systematic cleaning, standardization and sustenance across the plant and office premises of the organization as given in the organization guidelines

## Elements and Performance Criteria

### *Ensure proper sorting of items at the work place*

To be competent, the user/individual on the job must be able to:

- PC1..** ensure all recyclable materials are put in designated containers
- PC2.** ensure no tools, fixtures & jigs are lying on workstations unless in use and no un-necessary items is lying on workbenches or work surfaces unless in use
- PC3.** ensure that the operators and other team members are segregating the waste in hazardous/ non hazardous waste as per the sorting work instructions
- PC4.** ensure that all the operators are following the technique of waste disposal and waste storage in the designated bins
- PC5..** segregate the items which are labelled at red tag items for the process area and keep them in the correct places
- PC6..** ensure that all the tools/ equipment/ fasteners/ spare parts are arranged as per specifications/ utility into proper trays, cabinets, lockers as mentioned in the 5s guidelines/ work instructions
- PC7.** check for return of any type of extra material and tools to the designated sections and make sure that no additional material/ tool is lying near the work area
- PC8. .** oversee removal of unnecessary equipment, storage, furniture, unneeded inventory, supplies, parts and material
- PC9.** ensure that areas of material storage areas are not overflowing
- PC10.** ensure proper stacking and storage of 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

### *Ensure proper documentation and storage - streamlining & organizing the workplace*

To be competent, the user/individual on the job must be able to:

- PC11.** ensure that the team follows the given instructions and checks for labelling of fluids, oils lubricants, solvents, chemicals etc and proper storage of the same to avoid spillage, leakage, fire etc
- PC12.** make sure that all material and tools are stored in the designated places and in the manner indicated in the 5s instructions

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- PC13.** ensure that organizing the workplace takes place with due considerations to the principles of wasted motions, ergonomics, work & method study .

### *Ensure cleaning of self and the work place*

To be competent, the user/individual on the job must be able to:

- PC14.** ensure that the area has floors swept, machinery clean and is generally neat and tidy in case of cleaning, ensure that correct displays are maintained on the floor which indicate potential safety hazards
- PC15..** ensure workbenches and work surfaces are clean and in good condition
- PC16..** ensure adherence to the cleaning schedule for the lighting system to ensure proper illumination
- PC17..** ensure all recyclable materials are put in designated containers

### *Ensure standardization*

To be competent, the user/individual on the job must be able to:

- PC18.** ensure that daily cleaning standards and schedules to create a clean working environment are followed across the plant
- PC19..** ensure all recyclable materials are put in designated containers
- PC20. .** ensure logical and user friendly documentation and file management for all activities across the plant and create guidelines around standardization of processes
- PC21.** ensure timely creation and sharing of the 5s checklists
- PC22.** ensure that the 5s manual are available as per the timelines

### *Ensure sustenance*

To be competent, the user/individual on the job must be able to:

- PC23.** ensure team cooperation during the audit of 5 s activities
- PC24.** ensure that workmen are periodically trained to address challenges related to 5s
- PC25..** participate actively in employee work groups on 5s and encourage team members for active participation
- PC26..** oversee that the staff/operators are trained and fully understand 5s procedures
- PC27. .** ensure that all the guidelines for what to do and what not to do to build sustainability in 5s are mentioned in the 5s check lists/ work instructions and are easily searchable
- PC28.** ensure continuous training of the team members on 5s in order to increase their awareness and support implementation
- PC29.** ensure that all visual controls, notice boards, symbols etc at the manufacturing place are created, working and are put up as per the requirement

## Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** relevant standards, procedures and policies related to 5S followed in the company
- KU2.** have basic knowledge of 5S procedures
- KU3.** know various types 5s practices followed in various areas
- KU4.** understand the 5S checklists provided in the department/ team
- KU5.** have skills to identify useful & non useful items

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- KU6.** have knowledge of labels , signs & colours used as indicators
- KU7.** Have knowledge on how to sort and store various types of tools,equipment, material etc
- KU8.** know , how to identify various types of waste products
- KU9.** understand the impact of waste/ dirt/ dust/unwantedsubstances on the process/ environment/ machinery/ humanbody
- KU10.** have knowledge of best and environment protective ways ofcleaning & waste disposal
- KU11.** understand the importance of standardization in processes
- KU12.** understand the importance of sustainability in 5S
- KU13.** have knowledge of TQM process
- KU14.** have knowledge of various materials and storage norms
- KU15.** understand visual controls, symbols, graphs etc

## Generic Skills (GS)

User/individual on the job needs to know how to:

- GS1.** write basic level notes and observations
- GS2.** note down observations (if any) related to the process
- GS3.** write information documents to internal departments/ internal teams
- GS4.** read 5S instructions put up across the plant premises
- GS5.** effectively communicate information to team members inform employees in the plant and concerned functions about 5S
- GS6.** question the process head in order to understand the 5S related issues
- GS7.** attentively listen with full attention and comprehend the information given by the speaker during 5S training programs
- GS8.** use common sense and make judgments during day to day basis
- GS9.** use reasoning skills to identify and resolve basic problems using 5S
- GS10.** persuade team members to follow 5 S
- GS11.** ensure that the team members understand the importance of using 5 S tool
- GS12.** use innovative skills to perform and manage 5 S activities at the work desk and the shop floor
- GS13.** exhibit inquisitive behaviour to seek feedback and question on the existing set patterns of work emerge, techniques in CA/CI around 5 S work practices
- GS14.** do what is right, not what is a popular practice
- GS15.** follow shop floor rules& regulations and avoid deviations
- GS16.** lead by example in the plant premises while performing activities related to 5S
- GS17.** ensure self-cleanliness on a daily basis
- GS18.** demonstrate the will to keep the work area in a clean and orderly manner
- GS19.** accept additional responsibility for self and the team
- GS20.** encourage self and other to take greater responsibilities for managing 5S
- GS21.** identify obstacles and bottlenecks in the process and find basic level solutions for removing these obstacles

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- GS22.** use previous experience in resolving problems and taking decisions
- GS23.** make timely and independent decisions on the line/ shift within the boundaries of the delegation matrix of the organization

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### Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Ensure proper sorting of items at the work place</i>	<b>10</b>	<b>25</b>	-	-
<b>PC1..</b> ensure all recyclable materials are put in designated containers	1	2.5	-	-
<b>PC2.</b> ensure no tools, fixtures & jigs are lying on workstations unless in use and no un-necessary items is lying on workbenches or work surfaces unless in use	1	2.5	-	-
<b>PC3.</b> ensure that the operators and other team members are segregating the waste in hazardous/ non hazardous waste as per the sorting work instructions	1	2.5	-	-
<b>PC4.</b> ensure that all the operators are following the technique of waste disposal and waste storage in the designated bins	1	2.5	-	-
<b>PC5..</b> segregate the items which are labelled at red tag items for the process area and keep them in the correct places	1	2.5	-	-
<b>PC6..</b> ensure that all the tools/ equipment/ fasteners/ spare parts are arranged as per specifications/ utility into proper trays, cabinets, lockers as mentioned in the 5s guidelines/ work instructions	1	2.5	-	-
<b>PC7.</b> check for return of any type of extra material and tools to the designated sections and make sure that no additional material/ tool is lying near the work area	1	2.5	-	-
<b>PC8. .</b> oversee removal of unnecessary equipment, storage, furniture, unneeded inventory, supplies, parts and material	1	2.5	-	-
<b>PC9.</b> ensure that areas of material storage areas are not overflowing	1	2.5	-	-
<b>PC10.</b> ensure proper stacking and storage of 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	1	2.5	-	-

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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Ensure proper documentation and storage - streamlining &amp; organizing the workplace</i>	<b>3</b>	<b>7.5</b>	-	-
<b>PC11.</b> ensure that the team follows the given instructions and checks for labelling of fluids, oils lubricants, solvents, chemicals etc and proper storage of the same to avoid spillage, leakage, fire etc	1	2.5	-	-
<b>PC12.</b> make sure that all material and tools are stored in the designated places and in the manner indicated in the 5s instructions	1	2.5	-	-
<b>PC13.</b> ensure that organizing the workplace takes place with due considerations to the principles of wasted motions, ergonomics, work & method study .	1	2.5	-	-
<i>Ensure cleaning of self and the work place</i>	<b>4</b>	<b>10</b>	-	-
<b>PC14.</b> ensure that the area has floors swept, machinery clean and is generally neat and tidy in case of cleaning, ensure that correct displays are maintained on the floor which indicate potential safety hazards	1	2.5	-	-
<b>PC15..</b> ensure workbenches and work surfaces are clean and in good condition	1	2.5	-	-
<b>PC16..</b> ensure adherence to the cleaning schedule for the lighting system to ensure proper illumination	1	2.5	-	-
<b>PC17..</b> ensure all recyclable materials are put in designated containers	1	2.5	-	-
<i>Ensure standardization</i>	<b>5</b>	<b>12.5</b>	-	-
<b>PC18.</b> ensure that daily cleaning standards and schedules to create a clean working environment are followed across the plant	1	2.5	-	-
<b>PC19..</b> ensure all recyclable materials are put in designated containers	1	2.5	-	-

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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<b>PC20.</b> . ensure logical and user friendly documentation and file management for all activities across the plant and create guidelines around standardization of processes	1	2.5	-	-
<b>PC21.</b> ensure timely creation and sharing of the 5s checklists	1	2.5	-	-
<b>PC22.</b> ensure that the 5s manual are available as per the timelines	1	2.5	-	-
<i>Ensure sustenance</i>	<b>7</b>	<b>16</b>	-	-
<b>PC23.</b> ensure team cooperation during the audit of 5 s activities	1	2.5	-	-
<b>PC24.</b> ensure that workmen are periodically trained to address challenges related to 5s	1	2.5	-	-
<b>PC25..</b> participate actively in employee work groups on 5s and encourage team members for active participation	1	2	-	-
<b>PC26..</b> oversee that the staff/operators are trained and fully understand 5s procedures	1	2	-	-
<b>PC27.</b> . ensure that all the guidelines for what to do and what not to do to build sustainability in 5s are mentioned in the 5s check lists/ work instructions and are easily searchable	1	2.5	-	-
<b>PC28.</b> ensure continuous training of the team members on 5s in order to increase their awareness and support implementation	1	2	-	-
<b>PC29.</b> ensure that all visual controls, notice boards, symbols etc at the manufacturing place are created, working and are put up as per the requirement	1	2.5	-	-
<b>NOS Total</b>	<b>29</b>	<b>71</b>	-	-

## Qualification Pack

### National Occupational Standards (NOS) Parameters

<b>NOS Code</b>	ASC/N0022
<b>NOS Name</b>	Ensure implementation of 5S activities at the shop floor & the office area
<b>Sector</b>	Automotive
<b>Sub-Sector</b>	Generic
<b>Occupation</b>	Generic
<b>NSQF Level</b>	6
<b>Credits</b>	TBD
<b>Version</b>	1.0
<b>Last Reviewed Date</b>	15/03/2014
<b>Next Review Date</b>	15/03/2016
<b>NSQC Clearance Date</b>	

## Qualification Pack

### ASC/N4001: Understand processes and equipment requirement for designing tools and dies .

#### Description

This NOS unit is about understanding the job requirement and what processes need to be executed, what equipment will be used for the project and what is the required output considering the standards specified

#### Scope

The tool room designer will be responsible for understanding the process, process parameters and equipment requirements escalations of any queries regarding the job The job holder will various designing methods using CAD/ CAM and other software for designing tools and dies. The role holder will interact with the tool manufacturing team

#### Elements and Performance Criteria

##### *Understand the designing requirements, designing equipment and parameters to be set for the process*

To be competent, the user/individual on the job must be able to:

- PC1.** . ensure correct understanding of the customer requirements in terms of design and utility of the tool and the die
- PC2.** . ensure that the team members understand and follow all the does and donts of the manufacturing process as defined in sops/ work instructions or defined by supervisors/ master technicians
- PC3.** . understand the right designing 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
- PC4.** . understand the tolerance analysis sheet/ tolerance manual thoroughly to analyse the tolerance limits of the component. the tolerance analysis sheet is available with the customer for whom the tool & die designing will be conducted
- PC5.** . visualize the end product required by the customer and prepare a rough sketch of the end product
- PC6.** . correctly understand the use of various software used like catia, unigraphics etc. for creating the designs and models as specified in the work order/ customer
- PC7.** . understand 5 s related to the work station and implement 5s for workstation upkeep and upkeep of records pertaining to drawings and sketches

##### *Escalations of queries on the given job*

To be competent, the user/individual on the job must be able to:

- PC8.** . refer the queries to a competent internal specialist if they cannot be resolved by the designer on own
- PC9.** . obtain help or advice from specialist if the problem is outside his/her area of competence or experience
- PC10.** . confirm self-understanding with the specialist holding discussions so that all doubts & queries can be resolved before the actual process execution

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### Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** relevant standards and procedures followed in the company
- KU2.** different types of products manufactured by the company
- KU3.** the method of reading and interpreting drawings and sketches
- KU4.** how to visualize the final product output and conduct quality verification tests
- KU5.** different types of designing processes and associated software like CATIA, Unigraphics
- KU6.** 3D modelling, simulation, 2D drawings and online testing of models
- KU7.** different type of views generated in engineering drawings
- KU8.** different production and manufacturing related processes and equipment

### Generic Skills (GS)

User/individual on the job needs to know how to:

- GS1.** document information
- GS2.** note down observations (if any) related to the design aspect
- GS3.** write information documents to internal departments/ internal teams or enter the information in online ERP systems under guidance of the supervisor
- GS4.** read and interpret technical customer drawings
- GS5.** read software manuals and process documents to understand the software and processes better
- GS6.** read internal information documents sent by internal teams
- GS7.** discuss task lists, schedules and activities with the supervisor
- GS8.** effectively communicate with the team members
- GS9.** question the customer in order to understand the nature of the problem and to clarify queries
- GS10.** attentively listen with full attention and comprehend the information given by the speaker
- GS11.** plan and organize the work order and jobs received from the customer
- GS12.** organize all process/ equipment manuals so that sorting/ accessing information is easy
- GS13.** use common sense and make judgments during day to day basis
- GS14.** use reasoning skills to identify and resolve basic problems use intuition and keen observation skills to detect any potential problems which could arise during operations
- GS15.** follow instructions and work on areas of improvement identified
- GS16.** complete the assigned tasks with minimum supervision
- GS17.** complete the job defined by the supervisor within timelines and quality norms
- GS18.** detect problems in day to day tasks
- GS19.** support supervisor in using specific problem solving techniques and detailing out the problems
- GS20.** discuss possible solution with the supervisor for problem solving

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**GS21.** make decisions in emergency conditions in case the supervisor is not available( as per the authority matrix defined by the organization)

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### Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Understand the designing requirements, designing equipment and parameters to be set for the process</i>	<b>21</b>	<b>49</b>	-	-
<b>PC1.</b> . ensure correct understanding of the customer requirements in terms of design and utility of the tool and the die	3	7	-	-
<b>PC2.</b> . ensure that the team members understand and follow all the does and donts of the manufacturing process as defined in sops/ work instructions or defined by supervisors/ master technicians	3	7	-	-
<b>PC3.</b> . understand the right designing 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	3	7	-	-
<b>PC4.</b> . understand the tolerance analysis sheet/ tolerance manual thoroughly to analyse the tolerance limits of the component. the tolerance analysis sheet is available with the customer for whom the tool & die designing will be conducted	3	7	-	-
<b>PC5.</b> . visualize the end product required by the customer and prepare a rough sketch of the end product	3	7	-	-
<b>PC6.</b> . correctly understand the use of various software used like catia, unigraphics etc. for creating the designs and models as specified in the work order/ customer	3	7	-	-
<b>PC7.</b> . understand 5 s related to the work station and implement 5s for workstation upkeep and upkeep of records pertaining to drawings and sketches	3	7	-	-
<i>Escalations of queries on the given job</i>	<b>9</b>	<b>21</b>	-	-
<b>PC8.</b> . refer the queries to a competent internal specialist if they cannot be resolved by the designer on own	3	7	-	-

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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<b>PC9.</b> . obtain help or advice from specialist if the problem is outside his/her area of competence or experience	3	7	-	-
<b>PC10.</b> . confirm self-understanding with the specialist holding discussions so that all doubts & queries can be resolved before the actual process execution	3	7	-	-
<b>NOS Total</b>	<b>30</b>	<b>70</b>	-	-

## Qualification Pack

### National Occupational Standards (NOS) Parameters

<b>NOS Code</b>	ASC/N4001
<b>NOS Name</b>	Understand processes and equipment requirement for designing tools and dies .
<b>Sector</b>	Automotive
<b>Sub-Sector</b>	Manufacturing
<b>Occupation</b>	Tool Room
<b>NSQF Level</b>	5
<b>Credits</b>	TBD
<b>Version</b>	1.0
<b>Last Reviewed Date</b>	06/11/2013
<b>Next Review Date</b>	06/11/2013
<b>NSQC Clearance Date</b>	

## Qualification Pack

### ASC/N4002: Performing the tool and die designing Operation

#### Description

This NOS is about understanding customer requirements and designing tools and dies using the right kinds of computer graphic tools

#### Scope

The tool room designer will be responsible for understanding the customer requirements designing tools using various software based tools inspect and store graphs, charts and drawing files The job holder will use various designing methods using CAD/ CAM and other soft wares for designing tools and dies. The role holder will interact with the tool manufacturing team

#### Elements and Performance Criteria

##### *Understanding the customer requirement*

To be competent, the user/individual on the job must be able to:

- PC1.** . coordinate with the internal/ external customer for understanding the tool & die requirements including need and utility of the tool/ die
- PC2.** . ensure that the information received from the internal/ external customer is correct and complete
- PC3.** . ensure that the understanding of the customer requirement is correct

##### *Design the Tool and the Die as per customer specifications*

To be competent, the user/individual on the job must be able to:

- PC4.** . create a physical drawing of the product visualizing the final product and then creating a design/ drawing
- PC5..** understand dimensions, measurements and tolerances of the product creating drawings with dimensions
- PC6..** understand the type of material which will be used for making the tool and die to accommodate the same during the tool & die designing process
- PC7. .** calculate formulae using geometric and trigonometric rules to develop & design specifications for the tool and the die
- PC8..** work on CAM/ CAD to generate 3D product model from the incoming drawing of the customer
- PC9. .** create layouts and drawing with various views to generate relationship between components and assemblies
- PC10. .** ensure that the design considerations like undercut, ejection system, parallel ejection system, quantity of material to be used during the tool & die design process, final usage machine design where the die will be fitted/ tool used etc. are understood by using the tool design reference hand book
- PC11..** use various drawing/ drafting aids like colours, symbols etc. to highlight areas in the drawings
- PC12..** test the 3D model through simulation on feasibility of actual product as per the customer requirement

## Qualification Pack

- PC13.** . test the 3D model online for various performance and durability tests
- PC14.** . generate the 2D drawing for the actual manufacturing of the tool and share the same with the manufacturing team for their comments
- PC15..** ensure necessary instructions and comments are added in the drawing sheets as well as 2D/ 3D models to easy the understanding of the drawing
- PC16.** . ensure that the program used for tool manufacturing is in line with the 2D drawing submitted by the design team

### *Inspection and storage*

To be competent, the user/individual on the job must be able to:

- PC17.** . conduct quality inspection of the drawing for various tolerances
- PC18.** . ensure that the feedback shared by the manufacturing team on the 2D drawings is incorporated in the final drawing/ design and the drawings are modified
- PC19.** . ensure that the drawings are tagged with the right numbers & codes as per the internal sops
- PC20..** ensure that the drawings ( hard copies & soft copies) are stored in the right places which can be easily accessed by the team

## Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** the raw material to be used for the tool & die designing process raw material quantity, quality and raw material properties
- KU2.** customer interaction and customer need analysis/ customer requirement analysis
- KU3.** how to interpret Tolerance Analysis sheet supplied by the customer
- KU4.** how to use Tool Design Handbook
- KU5.** understand various dimensional mismatches which may happen on the actual product assembly
- KU6.** relevant standards and procedures followed in the company
- KU7.** different types of products manufactured by the company
- KU8.** key customers of the organization and their products
- KU9.** different types of designing processes and associated software for tool & die design CATIA, IDEAS, Unigraphics etc.
- KU10.** computer programming and drafting skills
- KU11.** the method of reading and interpreting the various customer drawings
- KU12.** 3D modelling, simulation, 2D drawings and online testing
- KU13.** algebra and trigonometric rules and applications
- KU14.** how to visualize the final product output and conduct quality verification tests
- KU15.** knowledge of the manufacturing process in which the final tool & die will be used

## Generic Skills (GS)

User/individual on the job needs to know how to:

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- GS1.** document information required for creating the designs
- GS2.** create drawings in 2D and 3D framework as per the Tolerance Analysis Sheet and the Customer Need Analysis
- GS3.** create drawing records for storage as defined in the SOPs
- GS4.** read and interpret technical customer drawings
- GS5.** read symbols and dimensions used in the drawings
- GS6.** read software manuals and process documents to understand the software and processes
- GS7.** read internal information documents sent by internal teams
- GS8.** discuss task lists, schedules and activities with the supervisor
- GS9.** effectively communicate with the team members
- GS10.** question the customer in order to understand the product requirement, nature of the problem and to clarify queries
- GS11.** attentively listen with full attention and comprehend the information given by the speaker
- GS12.** plan and organize the work order received from the internal customers
- GS13.** plan and organize the design/ process/quality documents received from internal customers
- GS14.** organize all drawings and manuals so that sorting out information is fast
- GS15.** carefully analyse the 3d simulation and 2D drawing for various customer specifications
- GS16.** carefully do the design analysis with relevant actions as listed in SOP/WI
- GS17.** visualize the final customer requirement including type of product, dimensions, shape, product usage, type of material to be used
- GS18.** offer different design solutions to the customer in order to arrive at the final product design
- GS19.** follow instructions and work on areas of improvement identified
- GS20.** complete the assigned tasks with minimum supervision
- GS21.** complete the job defined by the supervisor within timelines and quality norms
- GS22.** detect problems in day to day tasks
- GS23.** support supervisor in using specific problem solving techniques and detailing out the problems
- GS24.** discuss possible solution with the supervisor for problem solving
- GS25.** make decisions in emergency conditions in case the supervisor is not available( as per the authority matrix defined by the organization)

## Qualification Pack

### Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Understanding the customer requirement</i>	<b>4</b>	<b>11</b>	-	-
<b>PC1.</b> . coordinate with the internal/ external customer for understanding the tool & die requirements including need and utility of the tool/ die	2	3	-	-
<b>PC2.</b> . ensure that the information received from the internal/ external customer is correct and complete	1	4	-	-
<b>PC3.</b> . ensure that the understanding of the customer requirement is correct	1	4	-	-
<i>Design the Tool and the Die as per customer specifications</i>	<b>20</b>	<b>45</b>	-	-
<b>PC4.</b> . create a physical drawing of the product visualizing the final product and then creating a design/ drawing	2	3	-	-
<b>PC5.</b> .. understand dimensions, measurements and tolerances of the product creating drawings with dimensions	1	4	-	-
<b>PC6.</b> .. understand the type of material which will be used for making the tool and die to accommodate the same during the tool & die designing process	1	4	-	-
<b>PC7.</b> . calculate formulae using geometric and trigonometric rules to develop & design specifications for the tool and the die	2	3	-	-
<b>PC8.</b> .. work on CAM/ CADto generate 3D product model from the incoming drawing of the customer	2	3	-	-
<b>PC9.</b> . create layouts and drawing with various views to generate relationship between components and assemblies	2	3	-	-

### Qualification Pack

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<b>PC10.</b> . ensure that the design considerations like undercut, ejection system, parallel ejection system, quantity of material to be used during the tool & die design process, final usage machine design where the die will be fitted/ tool used etc. are understood by using the tool design reference hand book	1	4	-	-
<b>PC11..</b> use various drawing/ drafting aids like colours, symbols etc. to highlight areas in the drawings	2	3	-	-
<b>PC12..</b> test the 3D model through simulation on feasibility of actual product as per the customer requirement	1	4	-	-
<b>PC13.</b> . test the 3D model online for various performance and durability tests	1	4	-	-
<b>PC14.</b> . generate the 2D drawing for the actual manufacturing of the tool and share the same with the manufacturing team for their comments	2	3	-	-
<b>PC15..</b> ensure necessary instructions and comments are added in the drawing sheets as well as 2D/ 3D models to easy the understanding of the drawing	1	4	-	-
<b>PC16.</b> . ensure that the program used for tool manufacturing is in line with the 2D drawing submitted by the design team	2	3	-	-
<i>Inspection and storage</i>	<b>6</b>	<b>14</b>	-	-
<b>PC17.</b> . conduct quality inspection of the drawing for various tolerances	1	4	-	-
<b>PC18.</b> . ensure that the feedback shared by the manufacturing team on the 2D drawings is incorporated in the final drawing/ design and the drawings are modified	2	3	-	-
<b>PC19.</b> . ensure that the drawings are tagged with the right numbers & codes as per the internal sops	1	4	-	-
<b>PC20..</b> ensure that the drawings ( hard copies & soft copies) are stored in the right places which can be easily accessed by the team	2	3	-	-

## Qualification Pack

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<b>NOS Total</b>	<b>30</b>	<b>70</b>	-	-

## Qualification Pack

### National Occupational Standards (NOS) Parameters

<b>NOS Code</b>	ASC/N4002
<b>NOS Name</b>	Performing the tool and die designing Operation
<b>Sector</b>	Automotive
<b>Sub-Sector</b>	Manufacturing
<b>Occupation</b>	Tool Room
<b>NSQF Level</b>	5
<b>Credits</b>	TBD
<b>Version</b>	1.0
<b>Last Reviewed Date</b>	06/11/2013
<b>Next Review Date</b>	06/11/2013
<b>NSQC Clearance Date</b>	

## Qualification Pack

### Assessment Guidelines and Assessment Weightage

#### Assessment Guidelines

1. Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Element/ 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 Element/ 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 these criteria.
6. To pass the Qualification Pack assessment, every trainee should score the Recommended Pass % aggregate for the QP.
7. In case of unsuccessful completion, the trainee may seek reassessment on the Qualification Pack.

**Recommended Pass % : 75**

#### Assessment Weightage

##### Compulsory NOS

National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
ASC/N0006.Maintain a safe and healthy working environment	25	75	-	-	100	10
ASC/N0022.Ensure implementation of 5S activities at the shop floor & the office area	29	71	-	-	100	10
ASC/N4001.Understand processes and equipment requirement for designing tools and dies .	30	70	-	-	100	40

### Qualification Pack

National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
ASC/N4002.Performing the tool and die designing Operation	30	70	-	-	100	40
<b>Total</b>	<b>114</b>	<b>286</b>	<b>-</b>	<b>-</b>	<b>400</b>	<b>100</b>

## Qualification Pack

### Acronyms

<b>NOS</b>	National Occupational Standard(s)
<b>NSQF</b>	National Skills Qualifications Framework
<b>QP</b>	Qualifications Pack
<b>TVET</b>	Technical and Vocational Education and Training

## Qualification Pack

### Glossary

<b>Sector</b>	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.
<b>Sub-sector</b>	Sub-sector is derived from a further breakdown based on the characteristics and interests of its components.
<b>Occupation</b>	Occupation is a set of job roles, which perform similar/ related set of functions in an industry.
<b>Job role</b>	Job role defines a unique set of functions that together form a unique employment opportunity in an organisation.
<b>Occupational Standards (OS)</b>	OS specify the standards of performance an individual must achieve when carrying out a function in the workplace, together with the Knowledge and Understanding (KU) they need to meet that standard consistently. Occupational Standards are applicable both in the Indian and global contexts.
<b>Performance Criteria (PC)</b>	Performance Criteria (PC) are statements that together specify the standard of performance required when carrying out a task.
<b>National Occupational Standards (NOS)</b>	NOS are occupational standards which apply uniquely in the Indian context.
<b>Qualifications Pack (QP)</b>	QP comprises the set of OS, together with the educational, training and other criteria required to perform a job role. A QP is assigned a unique qualifications pack code.
<b>Unit Code</b>	Unit code is a unique identifier for an Occupational Standard, which is denoted by an 'N'
<b>Unit Title</b>	Unit title gives a clear overall statement about what the incumbent should be able to do.
<b>Description</b>	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.
<b>Scope</b>	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.

## Qualification Pack

<b>Knowledge and Understanding (KU)</b>	Knowledge and Understanding (KU) are statements which together specify the technical, generic, professional and organisational specific knowledge that an individual needs in order to perform to the required standard.
<b>Organisational Context</b>	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.
<b>Technical Knowledge</b>	Technical knowledge is the specific knowledge needed to accomplish specific designated responsibilities.
<b>Core Skills/ Generic Skills (GS)</b>	Core skills or Generic Skills (GS) 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. These skills are typically needed in any work environment. In the context of the OS, these include communication related skills that are applicable to most job roles.
<b>Electives</b>	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.
<b>Options</b>	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.