

Qualification Pack



In-charge Material Testing

QP Code: ASC/Q6504

Version: 1.0

NSQF Level: 6

Automotive Skills Development Council || 153, Gr Floor, Okhla Industrial Area, Phase - III, Leela Building
New Delhi - 110020

Qualification Pack

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ASC/Q6504: In-charge Material Testing

Brief Job Description

Individuals at this job need to administer metallurgical testing, physical & chemical testing and failure analysis of materials for fabrication of parts and other components that finally go into Manufacturing of different products.

Personal Attributes

The individual should be willing to working a laboratory environment for long hours. The individual should possess strong decision making skills. The individual should also be able to demonstrate skills for mathematical reasoning, critical thinking, technology design and comprehension.

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/N6503: Perform testing and validation of materials](#)
4. [ASC/N6504: Develop alternate material for improving the product quality](#)

Qualification Pack (QP) Parameters

Sector	Automotive
Sub-Sector	R & D Support
Occupation	Testing and Validation
Country	India
NSQF Level	6
Aligned to NCO/ISCO/ISIC Code	NCO-2015/1223.0102
Minimum Educational Qualification & Experience	B.Tech (Polymer/Chemical Technology) with 3-5 Years of experience R&D department OR Diploma (Polymer/Chemical Technology) with 0-6 Months of experience

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Minimum Level of Education for Training in School	
Pre-Requisite License or Training	Compulsory: Stress analysis techniques ,Material testing and validation techniques , FEA, product/components testing methods, knowledge of TS16949/ISO14001/EMS systems Voluntary: Information flow systems like ERP/SAP
Minimum Job Entry Age	18 Years
Last Reviewed On	23/09/2013
Next Review Date	30/06/2020
Deactivation Date	30/06/2020
NSQC Approval Date	28/09/2015
Version	1.0

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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:

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- KU1.** relevant standards, procedures and policies related to Health, Safety and Environment followed in the company
- 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>	8	23	-	-
PC1.. Identify activities which can cause potential injury through sharp objects, burns, fall, electricity, gas leakages, radiation, poisonous fumes, chemicals ,loud noise	3	6	-	-
PC2. Inform the concerned authorities about the potential risks identified in the processes, workplace area/ layout, materials used etc	2	6	-	-
PC3. Inform the concerned authorities about machine breakdowns, damages which can potentially harm man/ machine during operations	2	6	-	-
PC4. 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>	17	52	-	-
PC5.. Follow the instructions given on the equipment manual describing the operating process of the equipments	3	7	-	-
PC6.. Follow the Safety, Health and Environment related practices developed by the organization	3	8	-	-
PC7. Operate the machine using the recommended Personal Protective Equipments (PPE)	3	8	-	-
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	2	8	-	-
PC9. Maintain high standards of personal hygiene at the work place	2	7	-	-
PC10. 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
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	1	6	-	-
NOS Total	25	75	-	-

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National Occupational Standards (NOS) Parameters

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

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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

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- PC12.** make sure that all material and tools are stored in the designated places and in the manner indicated in the 5s instructions
- 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

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- KU4.** understand the 5S checklists provided in the department/ team
- KU5.** have skills to identify useful & non useful items
- 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

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- GS21.** identify obstacles and bottlenecks in the process and find basic level solutions for removing these obstacles
- 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>	10	25	-	-
PC1.. ensure all recyclable materials are put in designated containers	1	2.5	-	-
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	1	2.5	-	-
PC3. 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	-	-
PC4. ensure that all the operators are following the technique of waste disposal and waste storage in the designated bins	1	2.5	-	-
PC5.. segregate the items which are labelled at red tag items for the process area and keep them in the correct places	1	2.5	-	-
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	1	2.5	-	-
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	1	2.5	-	-
PC8. . oversee removal of unnecessary equipment, storage, furniture, unneeded inventory, supplies, parts and material	1	2.5	-	-
PC9. ensure that areas of material storage areas are not overflowing	1	2.5	-	-
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	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 & organizing the workplace</i>	3	7.5	-	-
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	1	2.5	-	-
PC12. 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	-	-
PC13. 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>	4	10	-	-
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	1	2.5	-	-
PC15.. ensure workbenches and work surfaces are clean and in good condition	1	2.5	-	-
PC16.. ensure adherence to the cleaning schedule for the lighting system to ensure proper illumination	1	2.5	-	-
PC17.. ensure all recyclable materials are put in designated containers	1	2.5	-	-
<i>Ensure standardization</i>	5	12.5	-	-
PC18. ensure that daily cleaning standards and schedules to create a clean working environment are followed across the plant	1	2.5	-	-
PC19.. 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
PC20. . 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	-	-
PC21. ensure timely creation and sharing of the 5s checklists	1	2.5	-	-
PC22. ensure that the 5s manual are available as per the timelines	1	2.5	-	-
<i>Ensure sustenance</i>	7	16	-	-
PC23. ensure team cooperation during the audit of 5 s activities	1	2.5	-	-
PC24. ensure that workmen are periodically trained to address challenges related to 5s	1	2.5	-	-
PC25.. participate actively in employee work groups on 5s and encourage team members for active participation	1	2	-	-
PC26.. oversee that the staff/operators are trained and fully understand 5s procedures	1	2	-	-
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	1	2.5	-	-
PC28. ensure continuous training of the team members on 5s in order to increase their awareness and support implementation	1	2	-	-
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	1	2.5	-	-
NOS Total	29	71	-	-

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National Occupational Standards (NOS) Parameters

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

Qualification Pack

ASC/N6503: Perform testing and validation of materials

Description

This OS unit is about the individual performing the testing and validation activities of materials used in fabrication of parts and components that are the assembled into the final product

Scope

The unit/ task covers the following:

- metallurgical and chemical testing of incoming materials
- failure analysis of the product
- resource management

Elements and Performance Criteria

Metallurgical and chemical testing

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

- PC1..** maintain laboratory for performing testing and validation activities for materials of construction for various parts/components that are fitted into the final product like engine, chassis , forging and machining, suspension , brakes etc.
- PC2..** ensure that the laboratory is well equipped to perform testing of materials like material confirmation, microstructure analysis, surface/material defects, hardness, tensile strength etc.
- PC3..** ensure that the sample of each part/component has been prepared based on the process requirements
- PC4..** monitor the procedures for performing tests being done by associates and ensure strict compliance to hse requirements
- PC5..** discuss with each associate the test findings and ensure its documentation & communication
- PC6..** coordinate with the process owner and establish traceability upto the validation samples so that results can be co-related.
- PC7..** ensure that the testing and validation results are being documented as per the ISO/IEC17025/NABL requirements
- PC8..** in case , the material is non-conforming , then quarantine it and participate to perform failure analysis of the material in its manufacturing process.

Failure analysis

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

- PC9..** ensure that the data pertaining to the suspected material for field failures has been collated properly for further analysis
- PC10..** ensure that the associates are having all the process documents pertaining to the suspected material like PFMEAs , failure reports , material inspection reports etc.
- PC11..** based on the criticality and failure occurrence of the suspected failed part/component , decide the method of failure analysis; destructive testing or non destructive testing (NDT)

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- PC12..** in case of destructive testing ,ensure the cutting of a section of the suspected part and perform the testing like corrosion analysis , stress analysis etc.
- PC13..** while in case of ndt ,ensure usage of techniques like electromagnetic radiation , spectroscopy , sound etc. for examining the suspected material
- PC14..** in both cases ,jointly analyze, validate and ensure the documentationof the results
- PC15..** discuss the findings with r&d department and seek their inputs
- PC16..** based on the discussions inform the concerned process department and ensure that in case of rejection , the complete batch of the rejected material part is quarantined/ recalled.
- PC17..** in case of rejection , internally with team perform testing and decide the most conforming material for the part in discussions with sourcing and r&d
- PC18..** finalize the material and accordingly based on validation , approve the material of sample part and generate a process change note (PCN) in SAP/ERP for implementation of the new material part

Resource management New Technology

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

- PC19..** recruit sufficient amount of staff in coordination with hr department for carrying out the various activities in material lab department
- PC20..** ensure that the new joinare trained by the existing staff members in an efficient and timely manner and talent to practice various techniques are available.
- PC21..** follow up with QA/ senior management for requirement of new testing equipments
- PC22..** procure new equipmentsas per requirement and monitor the working, calibration and maintenance of existing equipments
- PC23..** be in touch with new developments in evaluation techniques, materials etc and factor these at appropriate stages viz new developments, recruitments

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** product portfolio of organization
- KU2.** the manufacturing processes of organization
- KU3.** the list of approved vendors for the outsourced materials
- KU4.** protocol for communication regarding change of material for an outsourced material
- KU5.** Personnel and other HR policies of the organization
- KU6.** raw materials being used for manufacturing of each product
- KU7.** physical, chemical and metallurgical properties of each material
- KU8.** storage conditions required for each material
- KU9.** material handling equipments used for loading and unloading activity
- KU10.** testing and validation techniques used
- KU11.** failure analysis techniques used for examining materials samples
- KU12.** ISO/IEC17025/, NABLsystem requirements
- KU13.** information systems like SAP, ERP etc.

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Generic Skills (GS)

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

- GS1.** read and understand the usage of different tools and techniques for material testing
- GS2.** interpret the analysis reports for various failures like stress , corrosion etc
- GS3.** document all the testing and validation activities findings in form of MS Word documents , MS Excel spreadsheets etc.
- GS4.** communicate with the concerned departments for gathering part/component failure data
- GS5.** follow up with team members for monitoring the progress of activities
- GS6.** conduct meetings with R&D head/top management in case of any issues pertaining to results obtained
- GS7.** ensure that the corrective actions are implemented at both department and vendors end for resolution of non-conformities pertaining to material of the part/component
- GS8.** distribute workload among team members for ensuring testing and validation of material in a timely and efficient manner
- GS9.** share operation knowledge with colleagues
- GS10.** work on actions to be taken on immediate basis in case of frequent material rejections
- GS11.** work on the corrective and preventive actions for resolution of nonconformities pertaining to defective material
- GS12.** identify problems (technical and non-technical), disruptions and delays
- GS13.** identify cost effective methods of testing and examination of the material of sample part
- GS14.** take external support for technique/ equipment required but not available within the organization

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Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Metallurgical and chemical testing</i>	12	25	-	-
PC1.. maintain laboratory for performing testing and validation activities for materials of construction for various parts/components that are fitted into the final product like engine, chassis , forging and machining, suspension , brakes etc.	1	3	-	-
PC2.. ensure that the laboratory is well equipped to perform testing of materials like material confirmation,microstructure analysis, surface/material defects, hardness, tensile strength etc.	2	3	-	-
PC3.. ensure that the sample of each part/component has been prepared based on the process requirements	2	3	-	-
PC4.. monitor the procedures for performing tests being done by associates and ensure strict compliance to hse requirements	2	3	-	-
PC5.. discuss with each associate the test findings and ensure its documentation&communication .	2	3	-	-
PC6.. coordinate with the process owner and establish traceability upto the validation samples so that results can be co-related.	1	3	-	-
PC7.. ensure that the testing and validation results are being documented as per the ISO/IEC17025/NABL requirements	1	3	-	-
PC8.. in case , the material is non-conforming , then quarantine it and participate to perform failure analysis of the material in its manufacturing process.	1	4	-	-
<i>Failure analysis</i>	13	30	-	-
PC9.. ensure that the data pertaining to the suspected material for field failures has been collated properly for further analysis	1	3	-	-

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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC10.. ensure that the associates are having all the process documents pertaining to the suspected material like PFMEAs , failure reports , material inspection reports etc.	1	3	-	-
PC11.. based on the criticality and failure occurrence of the suspected failed part/component , decide the method of failure analysis; destructive testing or non destructive testing(NDT)	1	3	-	-
PC12.. in case of destructive testing ,ensure the cutting of a section of the suspected part and perform the testing like corrosion analysis , stress analysis etc.	1	3	-	-
PC13.. while in case of ndt ,ensure usage of techniques like electromagnetic radiation , spectroscopy , sound etc. for examining the suspected material	1	3	-	-
PC14.. in both cases ,jointly analyze, validate and ensure the documentationof the results	2	3	-	-
PC15.. discuss the findings with r&d department and seek their inputs	1	3	-	-
PC16.. based on the discussions inform the concerned process department and ensure that in case of rejection , the complete batch of the rejected material part is quarantined/ recalled.	1	3	-	-
PC17.. in case of rejection , internally with team perform testing and decide the most conforming material for the part in discussions with sourcing and r&d	2	3	-	-
PC18.. finalize the material and accordingly based on validation , approve the material of sample part and generate a process change note (PCN) in SAP/ERP for implementation of the new material part	2	3	-	-
<i>Resource management New Technology</i>	5	15	-	-
PC19.. recruit sufficient amount of staff in coordination with hr department for carrying out the various activities in material lab department	1	3	-	-

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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC20.. ensure that the new joinare trained by the existing staff members in an efficient and timely manner and talent to practice various techniques are available.	1	3	-	-
PC21.. follow up with QA/ senior management for requirement of new testing equipments	1	3	-	-
PC22.. procure new equipmentsas per requirement and monitor the working, calibration and maintenance of existing equipments	1	3	-	-
PC23.. be in touch with new developments in evaluation techniques, materials etc and factor these at appropriate stages viz new developments, recruitments	1	3	-	-
NOS Total	30	70	-	-

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National Occupational Standards (NOS) Parameters

NOS Code	ASC/N6503
NOS Name	Perform testing and validation of materials
Sector	Automotive
Sub-Sector	R & D Support
Occupation	Testing and Validation
NSQF Level	6
Credits	TBD
Version	1.0
Last Reviewed Date	23/09/2013
Next Review Date	31/12/2015
NSQC Clearance Date	28/09/2015

Qualification Pack

ASC/N6504: Develop alternate material for improving the product quality

Description

This OS unit is about the individual developing the alternate material database forenhancing the performance of the product in terms of quality , durability and cost effectiveness

Scope

This unit/ task covers the following:

- analysing the customer requirements
- identification of alternate material
- development and validation of the identified material

Elements and Performance Criteria

Analysis of customer requirements

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

- PC1..** ensure the collection of data pertaining to the field failures of various parts/components due to material , PND- customer requirements, sor etc. from marketing and R&D department
- PC2..** analyze the failure data and identify thepart ,type of material failed and frequency of failure
- PC3..** based on analysis of failure data , prepare the list of non-conforming parts and select the most frequent and high cost value part
- PC4..** keeping in view the customer requirements , prepare a database of the most conforming material for the part in consideration based on the application
- PC5..** compare the identified materials with respect to physical , chemical properties , unit cost , performance improvement , availability etc. and select the most viable material for the part
- PC6..** with support from the design team re-develop the drawings/ specifications of the part considering the results on the new material

Development and validation

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

- PC7..** collaborate with sourcing department and convene a meeting with the part supplier
- PC8..** share with the supplier the new drawing of the part in SAP/ERP/PLM and communicate the requirements
- PC9..** if required , seek inputs from supplier and finalize the drawings of the new material part
- PC10..** discuss with the supplier the cost implications and accordingly finalize the commercial terms
- PC11..** accordingly finalize a schedule for new material development and ensure its strict adherence
- PC12..** coordinate with sourcing department and ensure the development of the sample part with the new material
- PC13..** in coordination with team , perform the various tests as per the standard operating procedures complying to the hse requirements
- PC14..** validate the results obtained and in coordination with supplier ensure the resolution of the discrepancies

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- PC15..** document the results for the validation and share it with the r&d department and senior management ; participate in decision making process.
- PC16..** participate , co-ordinate in the documentation/ release process with the design team with appropriate inputs
- PC17..** monitor the new material performance by regularly analyzing the performance of the part during process and field by capturing the data from concerned departments

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** product portfolio and product mix of organization
- KU2.** the manufacturing processes of organization
- KU3.** vendor database for all the materials sourced by organization
- KU4.** protocol for communication regarding new materials development among the various departments of the organization
- KU5.** raw materials being used for manufacturing of each product
- KU6.** physical and chemical properties of each material
- KU7.** storage conditions required for each material
- KU8.** database for information about materials used
- KU9.** testing and validation techniques used
- KU10.** failure analysis techniques used for examining materials samples
- KU11.** ISO/IEC17025/, NABL system requirements

Generic Skills (GS)

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

- GS1.** understand the data pertaining to the customer requirements
- GS2.** interpret the analysis reports for capturing information about the nonconforming parts
- GS3.** document all the testing and validation activities findings pertaining to new material development in form of MS Word documents , MS Excel spreadsheets etc
- GS4.** communicate with the concerned departments for gathering part/component failure data
- GS5.** follow up with team members for monitoring the progress of activities
- GS6.** conduct meetings with R&D head/top management in case of any issues pertaining to results obtained
- GS7.** ensure that the corrective actions are implemented at both department and vendors end for resolution of non-conformities pertaining to new material sample part validation
- GS8.** communicate with the R&D department for discussion the findings of sample part validation
- GS9.** coordinate with various departments and ensure requisite data availability for field failures, customer complaints, warranty issues pertaining to failed material part etc
- GS10.** distribute workload among team members to ensure timely completion of new material development activity

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- GS11.** share operation knowledge with colleagues
- GS12.** identify the best alternate material for a frequently failing part/component
- GS13.** resolve the discrepancies arising in new material sample part
- GS14.** identify problems (technical and non-technical), disruptions and delays
- GS15.** use escalation procedures
- GS16.** Keep abreast of special events such as holidays/ work calendars / maintenance shutdowns of suppliers & organization and plan accordingly so that the final schedules are adhered to

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Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Analysis of customer requirements</i>	16	26	-	-
PC1.. ensure the collection of data pertaining to the field failures of various parts/components due to material , PND- customer requirements, sor etc. from marketing and R&D department	2	4	-	-
PC2.. analyze the failure data and identify the part ,type of material failed and frequency of failure	3	5	-	-
PC3.. based on analysis of failure data , prepare the list of non-conforming parts and select the most frequent and high cost value part	3	4	-	-
PC4.. keeping in view the customer requirements , prepare a database of the most conforming material for the part in consideration based on the application	3	4	-	-
PC5.. compare the identified materials with respect to physical , chemical properties , unit cost , performance improvement , availability etc. and select the most viable material for the part	3	5	-	-
PC6.. with support from the design team re-develop the drawings/ specifications of the part considering the results on the new material	2	4	-	-
<i>Development and validation</i>	14	44	-	-
PC7.. collaborate with sourcing department and convene a meeting with the part supplier	1	4	-	-
PC8.. share with the supplier the new drawing of the part in SAP/ERP/PLM and communicate the requirements	1	4	-	-
PC9.. if required , seek inputs from supplier and finalize the drawings of the new material part	1	4	-	-
PC10.. discuss with the supplier the cost implications and accordingly finalize the commercial terms	1	4	-	-

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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC11.. accordingly finalize a schedule for new material development and ensure its strict adherence	1	4	-	-
PC12.. coordinate with sourcing department and ensure the development of the sample part with the new material	1	4	-	-
PC13.. in coordination with team , perform the various tests as per the standard operating procedures complying to the hse requirements	1	4	-	-
PC14.. validate the results obtained and in coordination with supplier ensure the resolution of the discrepancies	2	4	-	-
PC15.. document the results for the validation and share it with the r&d department and senior management ; participate in decision making process.	2	4	-	-
PC16.. participate , co-ordinate in the documentation/ release process with the design team with appropriate inputs	1	3	-	-
PC17.. monitor the new material performance by regularly analyzing the performance of the part during process and field by capturing the data from concerned departments	2	5	-	-
NOS Total	30	70	-	-

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National Occupational Standards (NOS) Parameters

NOS Code	ASC/N6504
NOS Name	Develop alternate material for improving the product quality
Sector	Automotive
Sub-Sector	R & D Support
Occupation	Testing and Validation
NSQF Level	6
Credits	TBD
Version	1.0
Last Reviewed Date	23/09/2013
Next Review Date	31/12/2015
NSQC Clearance Date	28/09/2015

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	15
ASC/N0022.Ensure implementation of 5S activities at the shop floor & the office area	29	71	-	-	100	15
ASC/N6503.Perform testing and validation of materials	30	70	-	-	100	35

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National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
ASC/N6504.Develop alternate material for improving the product quality	30	70	-	-	100	35
Total	114	286	-	-	400	100

Qualification Pack

Acronyms

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

Qualification Pack

Glossary

Sector	Sector is a conglomeration of different business operations having similar business and interests. It may also be defined as a distinct subset of the economy whose components share similar characteristics and interests.
Sub-sector	Sub-sector is derived from a further breakdown based on the characteristics and interests of its components.
Occupation	Occupation is a set of job roles, which perform similar/ related set of functions in an industry.
Job role	Job role defines a unique set of functions that together form a unique employment opportunity in an organisation.
Occupational Standards (OS)	OS specify the standards of performance an individual must achieve when carrying out a function in the workplace, together with the Knowledge and Understanding (KU) they need to meet that standard consistently. Occupational Standards are applicable both in the Indian and global contexts.
Performance Criteria (PC)	Performance Criteria (PC) are statements that together specify the standard of performance required when carrying out a task.
National Occupational Standards (NOS)	NOS are occupational standards which apply uniquely in the Indian context.
Qualifications Pack (QP)	QP comprises the set of OS, together with the educational, training and other criteria required to perform a job role. A QP is assigned a unique qualifications pack code.
Unit Code	Unit code is a unique identifier for an Occupational Standard, which is denoted by an 'N'
Unit Title	Unit title gives a clear overall statement about what the incumbent should be able to do.
Description	Description gives a short summary of the unit content. This would be helpful to anyone searching on a database to verify that this is the appropriate OS they are looking for.
Scope	Scope is a set of statements specifying the range of variables that an individual may have to deal with in carrying out the function which have a critical impact on quality of performance required.

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Knowledge and Understanding (KU)	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.
Organisational Context	Organisational context includes the way the organisation is structured and how it operates, including the extent of operative knowledge managers have of their relevant areas of responsibility.
Technical Knowledge	Technical knowledge is the specific knowledge needed to accomplish specific designated responsibilities.
Core Skills/ Generic Skills (GS)	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.
Electives	Electives are NOS/set of NOS that are identified by the sector as contributive to specialization in a job role. There may be multiple electives within a QP for each specialized job role. Trainees must select at least one elective for the successful completion of a QP with Electives.
Options	Options are NOS/set of NOS that are identified by the sector as additional skills. There may be multiple options within a QP. It is not mandatory to select any of the options to complete a QP with Options.