

QUALIFICATIONS PACK - OCCUPATIONAL STANDARDS FOR AUTOMOTIVE

What are Occupational Standards (OS)?

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

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Introduction

Qualifications Pack-Test Technician

SECTOR: AUTOMOTIVE

SUB-SECTOR:R&D

OCCUPATION: TESTING

JOB ROLE: TEST TECHNICIAN

REFERENCE ID: ASC/Q8401

ALIGNED TO : NCO-2004/Nil

Test Technician: This role is also known as the test fitter and is largely responsible setting the testing apparatus and the test vehicle on the test bench, observing the outcomes of the tests.

Brief Job Description: This role is responsible for conducting various types of tests inside the laboratory as well as supporting on road testing. The role holder is responsible for setting the test apparatus on the test bench, connecting the aggregates/ vehicle under test to the test bench, support the engineer in taking readings during tests procedures, making minor modifications to the test setup and keeping the test areas and apparatus in a clean and working condition.

Personal Attributes: The individual should be willing to work in a risky and physically enduring environment of long hours and repetitive work. The role holder should have good physique, dexterity in operating machine tools, ability to fix the right parts at the right places, hand and eye coordination, sense of time management, proper vision and no colour blindness, ability to provide correct feedback, high level of alertness, quick decision making, taking personal responsibility and orientation to safety, quality management and 5S.

Job Details	Qualifications Pack Code	ASC/Q/8401		
	Job Role	Test Technician		
	Credits(NSQF)	TBD	Version number	1.0
	Industry	Automotive	Drafted on	10/01/2014
	Sub-sector	R&D	Last reviewed on	20/1/2014
	Occupation	Testing	Next review date	Under revision expected date of revised version 31-Dec-15
	NSQC Clearance on	05/08/15		

Job Role	Test Technician
Role Description	This role is responsible for testing the aggregates and the vehicles in indoor system laboratories and on road testing area, arrange the test apparatus and the test product as per the work instructions, support the engineer in recording observations and keeping the test area and apparatus clean and in a working condition
NSQF level	4
Minimum Educational Qualifications	ITI – Mechanical
Maximum Educational Qualifications	BSc
Training (Suggested but not mandatory)	<ul style="list-style-type: none"> • Fundamentals of automobile working • Testing apparatus and automobile instrumentation • Usage of different tools for assembly operations • Quality, 5S and Safety aspects • Problem solving techniques
Minimum Job Entry Age	<p>1 ASDC recommends that candidates should seek full employment not before attaining an age of 18 years.</p> <p>2 However, as per Factories Act1948 :</p> <ul style="list-style-type: none"> - No one can be employed before attaining the age of 15 - A person between the age of 15 – 18 (both inclusive) could be employed only with employers who follow safety and security systems & processes and also that the employee in this bracket will be working under supervision. <p>3 Please note that under the Factories Act 1948, different States may have slightly varying provision which need to be adhered to.</p>
Experience	2-3 years in testing/ assembly in the automobile sector
Occupational Standards (OS)	1. ASC/N8401: Understand the testing requirement for laboratory testing of aggregates and vehicles and conduct on road testing of automobiles

	<ol style="list-style-type: none">2. ASC/N8402: Carry the testing process, note observations and make modifications in the test setup3. ASC/N0006A: Maintain a safe and healthy working environment4. ASC/N0021: Maintaining 5S at the work premises <p>Optional: N.A.</p>
Performance Criteria	As described in the relevant NOS units

Definitions	Keywords /Terms	Description
	Core Skills/Generic Skills	Core Skills or Generic Skills are a group of skills that are key to learning and working in today's world. These skills are typically needed in any work environment. In the context of the NOS, these include communication related skills that are applicable to most job roles.
	Function	Function is an activity necessary for achieving the key purpose of the sector, occupation, or area of work, which can be carried out by a person or a group of persons. Functions are identified through functional analysis and form the basis of NOS.
	Job role	Job role defines a unique set of functions that together form a unique employment opportunity in an organization.
	Knowledge and Understanding	Knowledge and Understanding are statements which together specify the technical, generic, professional and organizational specific knowledge that an individual needs in order to perform to the required standard.
	National Occupational Standards (NOS)	NOS are Occupational Standards which apply uniquely in the Indian context
	Occupation	Occupation is a set of job roles, which perform similar/related set of functions in an industry.
	Organisational Context	Organisational Context includes the way the organization is structured and how it operates, including the extent of operative knowledge managers have of their relevant areas of responsibility.
	Performance Criteria	Performance Criteria are statements that together specify the standard of performance required when carrying out a task.
	Qualifications Pack(QP)	Qualifications Pack comprises the set of NOS, together with the educational, training and other criteria required to perform a job role. A Qualifications Pack is assigned a unique qualification pack code.
	Qualifications Pack Code	Qualifications Pack Code is a unique reference code that identifies a qualifications pack.
Scope	Scope is the set of statements specifying the range of variables that an individual may have to deal with in carrying out the function which have a critical impact on the quality of performance required.	
Sector	Sector is a conglomeration of different business operations having similar businesses and interests. It may also be defined as a distinct subset of the economy whose components share similar characteristics and interests.	

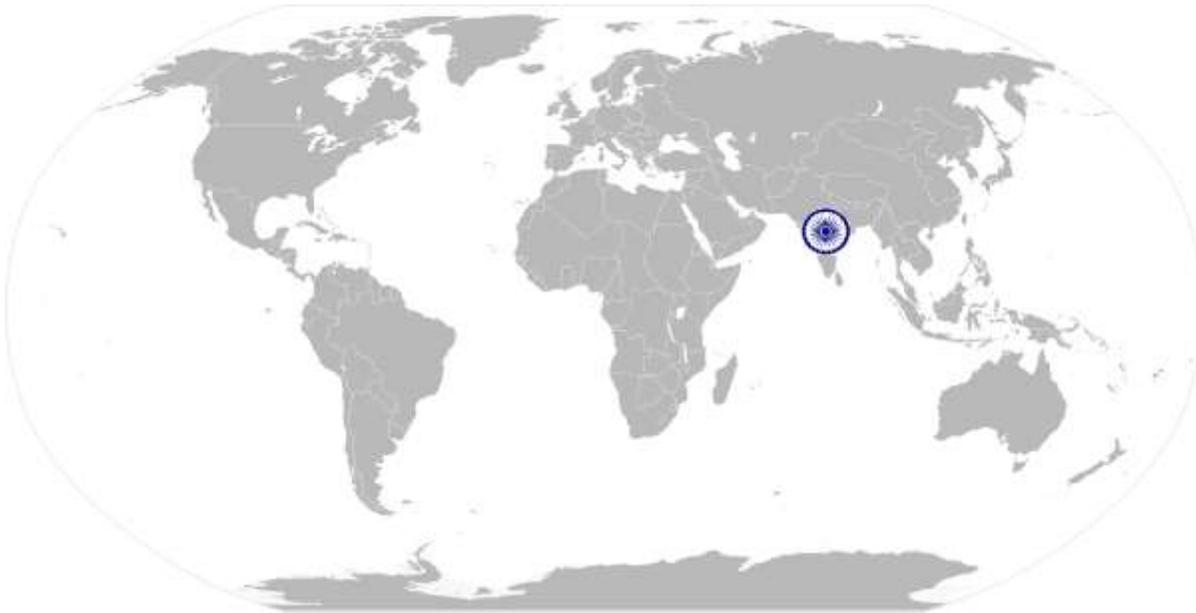
Sub-Sector	Sub-sector is derived from a further breakdown based on the characteristics and interests of its components.
Sub-functions	Sub-functions are sub-activities essential to fulfil the achieving the objectives of the function.
Technical Knowledge	Technical Knowledge is the specific knowledge needed to accomplish specific designated responsibilities.
Unit Code	Unit Code is a unique identifier for a NOS unit, which can be denoted with an 'N'
Unit Title	Unit Title gives a clear overall statement about what the incumbent should be able to do.
Vertical	Vertical may exist within a sub-sector representing different domain areas or the client industries served by the industry.
Keywords /Terms	Description
NOS	National Occupational Standard(s)
NSQF	National Skills Qualifications Framework
OEM	Original Equipment Manufacturer
OS	Occupational Standard(s)
QP	Qualifications Pack
NVH	Noise, Vibrations and Harshness

Acronyms

ASC/N8401

Understand the testing requirement for laboratory testing of aggregates and vehicles and conduct on road testing of automobiles

National Occupational Standards



Overview

This unit is about understanding the testing requirements for conducting various laboratory and on road tests to validate the performance of the prototype vehicle/ aggregate

ASC/N8401

Understand the testing requirement for laboratory testing of aggregates and vehicles and conduct on road testing of automobiles

National Occupational Standard	Unit Code	ASC/N8401
	Unit Title (Task)	Understand the testing requirement for laboratory testing of aggregates and vehicles and conduct on road testing of automobiles
	Description	This NOS is about understanding the various tests which need to be undertaken to complete the testing of aggregates and vehicles in various system evaluation laboratories and on road testing of vehicles
	Scope	The role holder will be responsible for: <ul style="list-style-type: none"> • understanding the testing requirement and the process • escalation of the queries to relevant stakeholders
	Performance Criteria (PC) w.r.t. the Scope	
	Element	Performance Criteria
	Understand the testing requirements, test equipment and parameters to be checked during the test procedure	<p>PC1. Understand the type of test which needs to be conducted on the component or the vehicle</p> <p>PC2. Clearly understanding the does and don'ts of the manufacturing process as defined in SOPs/ Work Instructions or defined by supervisors</p> <p>PC3. Ensure understanding of the type and specification of the component or the prototype vehicle under test procedure so that the correct test equipment/ test bench can be arranged</p> <p>PC4. Understand from the testing engineer the parameters which need to be measured during the test procedure</p> <p>PC5. Understand the material required and the equipment availability for executing the activity</p> <p>PC6. Ensure that the required material is procured from the store before starting the testing process – availability of greases, lubricant oil, adhesives, marking equipment, ID stickers/ labels</p> <p>PC7. Ensure that the correct equipment is selected by the technician as per the specification and testing sheet shared by the testing engineer</p> <p>PC8. Ensure availability of tools required for the assembly process as per the components to be assembled. Tool sizes as mentioned in the Work Instructions/ SOPs for assembly</p> <p>PC9. Understand key joining activities like welding and soldering which may be required during the test procedure</p> <p>PC10. Understand the various assembling process parameters like cycle time, pressure, torque etc. before starting the test apparatus assembling process, as mentioned in the Work Instructions/ SOP manual</p> <p>PC11. Understand the right assembling methodology and process(Bolting, tightening, riveting, fastening, adhesive clamping, crimping etc.) for arranging the test assembly through</p>

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	<p>discussions with the testing engineer and also by reading the process manuals/ Work Instructions/Standard Operating Procedures available</p> <p>PC12. Understand 5 S and Safety related aspects related to the testing process</p>
<p>Escalations of queries on the given job</p>	<p>PC13. Refer the queries to a competent internal specialist/ testing engineer if they cannot be resolved by the technician on own</p> <p>PC14. Obtain help or advice from specialist if the problem is outside his/her area of competence or experience</p> <p>PC15. Confirm self-understanding with the specialist holding discussions so that all doubts & queries can be resolved before the actual process execution</p>
Knowledge and Understanding (K)w.r.t. the scope	
Element	Knowledge and Understanding
<p>A. Organizational Context (Knowledge of the company / organization and its processes)</p>	<p>The user/individual on the job needs to know and understand:</p> <p>KA1. products manufactured by the company</p> <p>KA2. internal product standards finalized within the organization</p> <p>KA3. quality norms and standards prescribed in the Quality Manual by the organization</p> <p>KA4. 5S and Safety norms practiced in the organization</p>
<p>B. Technical Knowledge</p>	<p>The user/individual on the job needs to know and understand:</p> <p>KB1. the working of the internal combustion engine (Petrol/ Diesel)/ CNG engines</p> <p>KB2. different parts of the automobile and basic working principle of automobile aggregates</p> <p>KB3. different parameters used to evaluate the performance of the automobile</p> <p>KB4. process for setting up of test benches, test platforms and test apparatus</p> <p>KB5. basic laws of physics, chemistry, metallurgy & mathematics</p> <p>KB6. basic laws of geometry and product design</p> <p>KB7. the methods of using instruments like Vernier callipers, micrometres, rulers and other inspection tools</p> <p>KB8. how to read and interpret sketches and engineering drawings</p> <p>KB9. different types of assembling and joining processes and associated equipment</p> <p>KB10. the method of reading and interpreting the various gauges</p> <p>KB11. how to visualize the final product output</p> <p>KB12. the impact of various physical parameters like torqueing and tightening on the properties of final output product like durability, surface finish, part movement, aestheticsetc.</p> <p>KB13. various defects related to running automobiles and potential impact on the working of the final vehicle</p> <p>KB14. various sources of noise and vibrations in the vehicle and</p>

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	<p>potential causes of the noise and vibrations</p> <p>KB15. mandatory checks which need to be conducted on the vehicle before trial run</p> <p>KB16. potential health and safety hazards and related safety precautions</p>
Skills (S)w.r.t. the scope	
Elements	Skills
A. Core Skills/ Generic Skills	Writing and reading skills
	<p>The user/ individual on the job needs to know and understand how to:</p> <p>SA1. document information from the manuals, discussion notes, process charts etc.</p> <p>SA2. create small notes/ work documents/ diagrams/ maps for self-help to understand the process</p> <p>SA3. read equipment manuals and process documents to understand the equipment and processes better</p> <p>SA4. read internal information memos sent by internal customers (other functions within the organization)</p>
	Oral Communication (Listening and Speaking skills)
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SA5. discuss task lists, schedules, and work-loads with the test engineer</p> <p>SA6. answer the queries raised by the engineer as well as intercompany departments</p> <p>SA7. attentively listen with full attention to the speaker and comprehend the information given by the speaker</p>
B. Professional Skills	Analytical Thinking
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB1. break the problem into smaller issues and tasks to arrive at a solution</p> <p>SB2. understand inter process relationship and establish relationship between various parts of the problem</p> <p>SB3. leverage experience to find effective solutions to problems</p> <p>SB4. use basic analytical tools to arrive at solutions</p>
	Plan and Organize
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB5. plan and organize the work order and jobs received from the Operator</p> <p>SB6. organize all process/ equipment manuals so that sorting/ accessing information is easy</p> <p>SB7. keep fixtures, tools, drawings, Work Instructions, SOP manuals as per the part number, colour codes etc as defined under the 5S systems</p>

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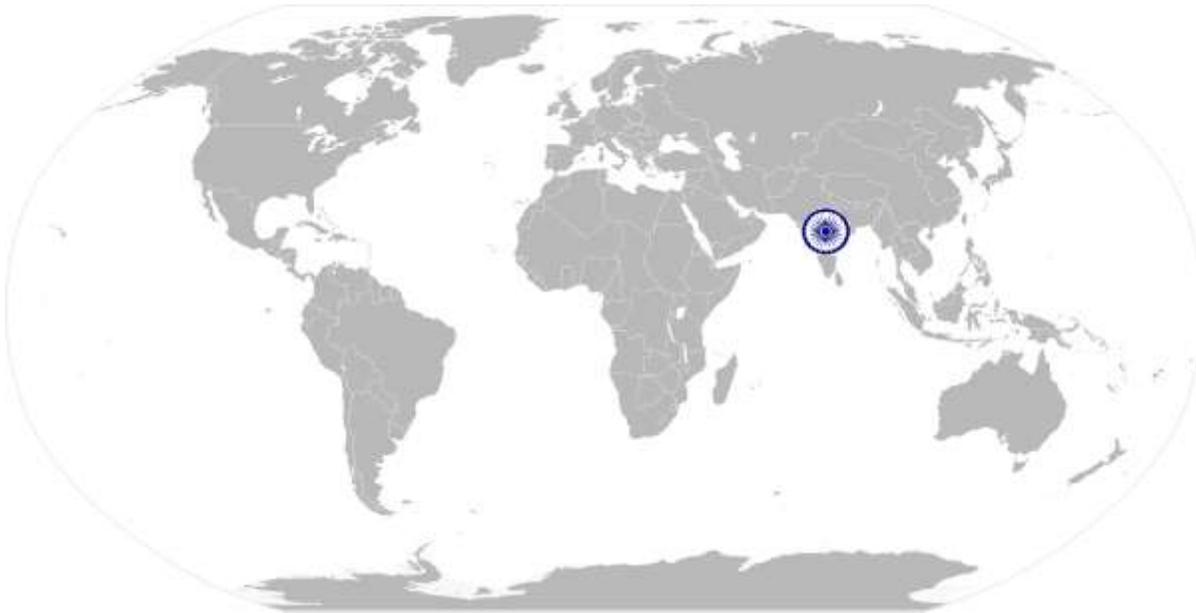
	<p>SB8. validate all process/ equipment manuals so that the final process selected is correct</p>
	<p>Judgment and Critical Thinking</p>
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB9. use common sense and make judgments during day to day basis</p> <p>SB10. use reasoning skills to identify and resolve basic problems</p> <p>SB11. use intuition and keen observation skills to detect any potential problems which could arise during operations</p>
	<p>Quality Consciousness</p>
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB12. identify faulty / flawed part and processes during the process and highlight the same to the concerned persons with the required time framework</p> <p>SB13. link the fault observed with the overall impact on the performance of the component/ automobile</p> <p>SB14. support and contribute in monitoring and delivering high quality output from self and others</p>
	<p>Problem solving and decision making</p>
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB15. gather information skilfully from multiple sources</p> <p>SB16. analyse information in depth and identifies the problem in a timely manner</p> <p>SB17. Work tireless in spite of repeat activities in a diligent manner to resolve problems on a day to day basis</p> <p>SB18. use previous experience in resolving problems and taking decisions</p>
	<p>Team work and collaboration</p>
	<p>The user/ individual on the job needs to know and understand how to:</p> <p>SB19. contribute to building a positive team spirit</p> <p>SB20. exhibit objectivity & openness to others' views</p> <p>SB21. collaborate with stakeholders to achieve the desired state of final result</p>
	<p>Out of Box thinking</p>
	<p>The user/ individual on the job needs to know and understand how to:</p> <p>SB22. familiarise with leading practices available in the market</p> <p>SB23. think independently on new approaches to manufacturing process, material management, data management and team management</p> <p>SB24. represent any new ideas/ approaches on process improvement and productivity improvement to the seniors in the team</p>

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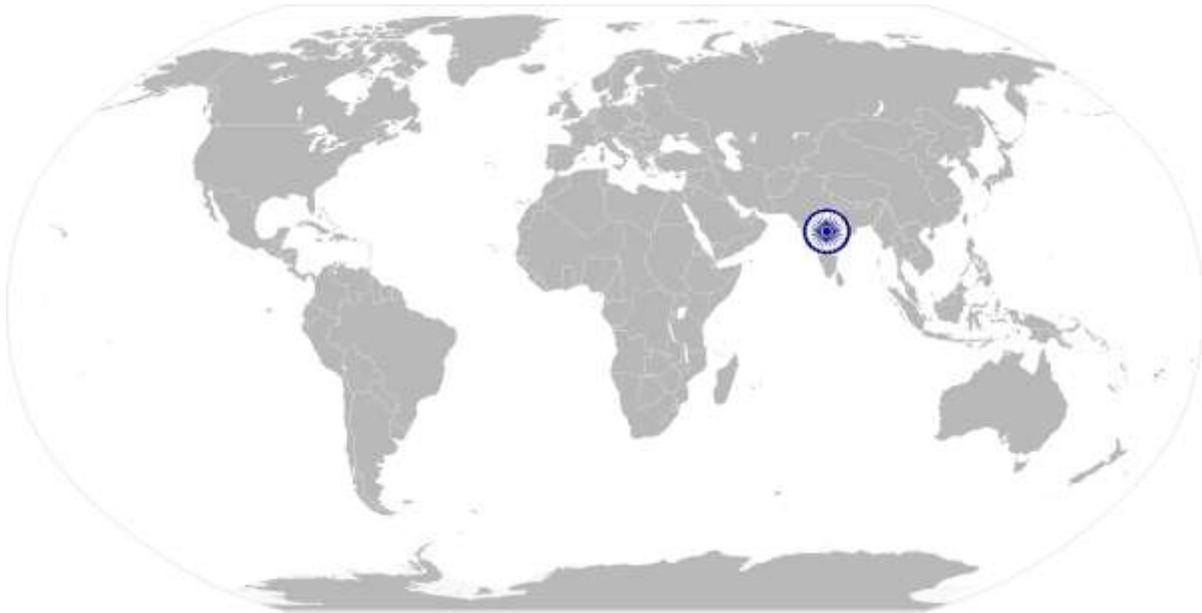
NOS Code	ASC/N8401		
Credits(NSQF)	TBD	Version number	1.0
Industry	Automotive	Drafted on	10/01/2014
Industry Sub-sector	R & D	Last reviewed on	20/1/2014
Occupation	Testing	Next review date	Under revision expected date of revised version 31-Dec-15



ASC/N8402

Carry the testing process, note observations and make modifications in the test setup

National Occupational Standard



Overview

This unit is about conducting the actual testing process, taking note of the observations and making minor modifications to the test setup as per requirements

ASC/N8402

Carry the testing process, note observations and make modifications in the test setup

National Occupational Standard

Unit Code	ASC/N8402
Unit Title (Task)	Carry the testing process, note observations and make modifications in the test setup
Description	This NOS is about conducting the test procedure as per the instructions given by the testing engineer and the work instructions, supporting the engineer in noting observations and make modifications to the set up to accommodate the various testing scenario and arrive at the final outcomes.
Scope	<p>The role holder will be responsible for:</p> <ul style="list-style-type: none"> • set up the test apparatus and test vehicles for the testing procedure • conduct the actual testing process as per the given instructions • noting the observations and make minor modifications in the setup
Performance Criteria(PC) w.r.t. the Scope	
Element	Performance Criteria
Setup the test apparatus and test vehicle or component for the testing process	<p>PC1. Conduct a thorough check up of the testing equipment and the external connections for the test apparatus</p> <p>PC2. Setup the test apparatus as per the selected testing process and the internal SOPs/ Work Instructions and the setting standards for the testing machine</p> <p>PC3. Ensure that the surface of the assembling gun/ Bolting gun is cleaned to remove dust and any other impurities</p> <p>PC4. Ensure that the hoists & cranes for lifting the parts are working in order as per the process requirement</p> <p>PC5. Ensure drop of sub-assemblies like frame , gear box, axles, car frame, etc. at the respective testing platforms/ benches without damaging the components</p> <p>PC6. Ensure that hoists are used to lift the right material from the conveyors, Bins, part trolleys etc.</p> <p>PC7. Ensure part clearances as specified in the Work Instructions/ Standard Operating Processes</p> <p>PC8. Pick the right fastening part and right tightening tool from the right tray/ kit trolley as identified in the Drawing/ Standard Operating Procedure/ Work Instruction and is correctly placed in the designated slot/ space as indicated in the Work Instructions/ SOP to fastening the component/ vehicle under test</p> <p>PC9. Conduct design and fabrication of the fixtures for conducting the durability tests</p> <p>PC10. Conduct test setup for components undergoing repeated vibrations and subjecting to frequent stresses like fuel tank, fuel system, crankshaft, connecting rods, suspension, power train and axle system</p> <p>PC11. Conduct proper connection of instruments like strain gauge, load cell and other servo hydraulics machines to induce and measure stress levels on the components</p>

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Carry the testing process, note observations and make modifications in the test setup

	<p>PC12. Make required connections of data logger/ Data Acquisition System as mentioned in the Standard Operating Procedure manual/ Work Instructions</p> <p>PC13. Conduct visual inspection of the bundled electrical and electronics \ wiring, Circuits and harness</p> <p>PC14. Check for orientation of terminals and connectors used for connecting the testing process</p> <p>PC15. Test for any short circuit/ open circuit for the electrical/ electronic connections in the test apparatus</p> <p>PC16. Check the working of the test apparatus post connecting the test component/ vehicle to ensure error free testing activity</p> <p>PC17. Ensure regular cleaning and maintenance of Fatigue Lab equipment like Fatigue Testing Machines, Servo Hydraulic Actuators, Material testing machine, impact testing machine, bending machines, torsional machines</p>
<p>Conduct actual test procedure under supervision of the test engineer</p>	<p>PC18. Ensure development of the test bogey for conducting the structural durability tests/ fatigue test/ stress test to be conducted in the Structure Durability Laboratory</p> <p>PC19. Start/ stop the test activity as per the instructions given by the test engineer and the steps mentioned in the testing manual/ Work Instructions</p> <p>PC20. Support the testing engineer in taking different observations/ readings as per the parameters mentioned in the testing manual/ Work Instructions</p> <p>PC21. Under supervision of the test engineer, make minor modification in the test setup/ vehicle/ component under testing to take reading under different scenarios</p> <p>PC22. Observe any deviations during the test process. Observe any noise or vibrations during the testing process. Inform the testing engineer of any deviations observed</p> <p>PC23. Change parts as directed by the testing engineer, fit new parts and continue the testing process under the supervision of the testing engineer</p> <p>PC24. Note the modifications which have been made to the original setup in order to derive comparisons between test scenarios</p> <p>PC25. Make connections of the various data capturing meters and instrumentation such as load cells, pneumatic/ PLC testing gauges, strain gauges, displacement transducers, accelerometers, GPS data collection devices and data loggers to capture the data points during the vehicle running condition</p> <p>PC26. Check all the safety features required for the vehicle under running condition are working and are checked as per the vehicle safety check list provided as per the checklist given in the testing manual</p> <p>PC27. Check the fuel level, oil/ lubricant level, cooling water level, tyre pressure etc. are checked before starting the on road testing of the vehicle</p>

ASC/N8402

Carry the testing process, note observations and make modifications in the test setup

	<p>prototype as per the checklist given in the testing manual</p> <p>PC28. Check for all system warning indicators showing system failures, loose connections, malfunctioning etc. are addressed before starting the various types of tests as per the checklist given in the testing manual.</p> <p>PC29. tabulate and record observations of phenomena, test results, data log etc.</p>
Knowledge and Understanding (K)	
<p>A. Organizational Context (Knowledge of the company / organization and its processes)</p>	<p>The user/individual on the job needs to know and understand:</p> <p>KA1. new products manufactured by the company</p> <p>KA2. internal product standards finalized within the organization</p> <p>KA3. 5S and Safety norms practiced in the organization</p>
<p>B. Technical Knowledge</p>	<p>The user/individual on the job needs to know and understand:</p> <p>KB1. the working of the internal combustion engine (Petrol/ Diesel)/ CNG engines</p> <p>KB2. different parts of the automobile and basic working principle of automobile aggregates</p> <p>KB3. different parameters used to evaluate the performance of the automobile</p> <p>KB4. process for setting up of test benches, test platforms and test apparatus</p> <p>KB5. basic laws of physics, chemistry. metallurgy & mathematics</p> <p>KB6. basic laws of geometry and product design</p> <p>KB7. the methods of using instruments like Vernier callipers, micrometres, rulers and other inspection tools</p> <p>KB8. how to read and interpret sketches and engineering drawings</p> <p>KB9. different types of assembling and joining processes and associated equipment</p> <p>KB10. fundamentals of servo hydraulics, acoustics holography, sound meters, vibration meters</p> <p>KB11. working of load cells and strain gauges and connecting them for test process</p> <p>KB12. fundamental structure and working of anechoic chambers and reverberation chambers</p> <p>KB13. fundamentals of instrumentation and usage of flow meters for checking fuel and lubrication flow, smoke meters, power transducers, temperature sensors, particle sensors process for setting up of test benches, test platforms and test apparatus various types of tests used to</p> <p>KB15. evaluate the design and performance of various automotive components different parameters used to evaluate the performance of the components</p>

ASC/N8402

Carry the testing process, note observations and make modifications in the test setup

	<p>KB16. the method of reading and interpreting the various gauges</p> <p>KB17. how to visualize the final product output</p> <p>KB18. the impact of various physical parameters like torquing and tightening on the properties of final output product like durability, surface finish, part movement, aesthetics etc.</p> <p>KB19. various defects related to running automobiles and potential impact on the working of the final vehicle</p> <p>KB20. various sources of noise and vibrations in the vehicle and potential causes of the noise and vibrations</p> <p>KB21. basic road driving skills and fundamentals of vehicle movement in various conditions</p> <p>KB22. mandatory checks which need to be conducted on the vehicle before trial run</p> <p>KB23. potential health and safety hazards and related safety precautions</p>
Skills (s) [optional]	
A. Core Skills/ Generic Skills	Writing and reading skills
	<p>The user/ individual on the job needs to know and understand how to:</p> <p>SA1. document information from the manuals, discussion notes, process charts etc.</p> <p>SA2. create small notes/ work documents/ diagrams/ maps for self-help to understand the process</p> <p>SA3. read equipment manuals and process documents to understand the equipment and processes better</p> <p>SA4. read internal information memos send by internal customers (other functions within the organization)</p>
	Oral Communication (Listening and Speaking skills)
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SA5. discuss task lists, schedules, and work-loads with the testing engineer</p> <p>SA6. answer the queries raised by the engineer as well as intercompany departments</p> <p>SA7. attentively listen with full attention to the speaker and comprehend the information given by the speaker</p>
B. Core Skills/ Generic Skills	Analytical Thinking
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB1. break the problem into smaller issues and tasks to arrive at a solution</p> <p>SB2. understand inter process relationship and establish relationship between various parts of the problem</p> <p>SB3. leverage experience to find effective solutions to problems</p> <p>SB4. use basic analytical tools to arrive at solutions</p>
	Plan and Organize
	<p>The user/individual on the job needs to know and understand how to:</p>

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Carry the testing process, note observations and make modifications in the test setup

	<p>SB5. plan and organize the work order and jobs received from the Operator</p> <p>SB6. organize all process/ equipment manuals so that sorting/ accessing information is easy</p> <p>SB7. keep fixtures, tools, drawings, Work Instructions, SOP manuals as per the part number, colour codes etc as defined under the 5S systems</p> <p>SB8. validate all process/ equipment manuals so that the final process selected is correct</p>
	Judgment and Critical Thinking
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB9. use common sense and make judgments during day to day basis</p> <p>SB10. use reasoning skills to identify and resolve problems</p> <p>SB11. use intuition to detect any potential problems which could arise during operations</p>
	Problem solving and decision making
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB12. gather information skilfully from multiple sources</p> <p>SB13. analyse information in depth and identifies the problem in a timely manner</p> <p>SB14. develop alternate solutions and resolves problems in early stages</p> <p>SB15. work tireless in spite of repeat activities in a diligent manner to resolve problems on a day to day basis</p> <p>SB16. use previous experience in resolving problems and taking decisions</p>
	Out of Box thinking
	<p>The user/ individual on the job needs to know and understand how to:</p> <p>SB17. familiarise with leading practices available in the market</p> <p>SB18. represent any new ideas/ approaches on process improvement and productivity improvement to the seniors in the team</p>
	Collaboration
	<p>The user/ individual on the job needs to know and understand how to:</p> <p>SB19. exhibit objectivity & openness to others' views</p> <p>SB20. collaborate with stakeholders to achieve the desired state of final result</p>

ASC/N8402

Carry the testing process, note observations and make modifications in the test setup

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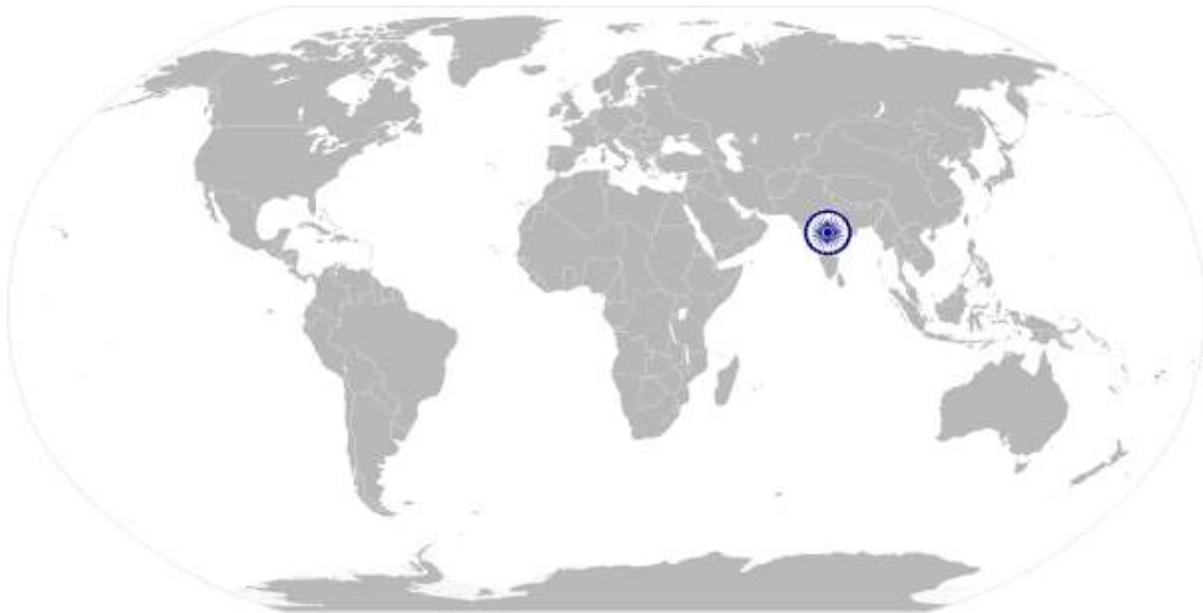
NOS Code	ASC/N8402		
Credits(NSQF)	TBD	Version number	1.0
Industry	Automotive	Drafted on	10/01/2014
Industry Sub-sector	R &D	Last reviewed on	20/1/2014
Occupation	Testing	Next review date	Under revision expected date of revised version 31-Dec-15



ASC/N0006

Maintain a safe and healthy working environment

National Occupational Standards



Overview

This unit is about maintaining a Safe and Healthy working environment

ASC/N0006

Maintain a safe and healthy working environment

National Occupational Standard	Unit Code	ASC/N0006
	Unit Title (Task)	Maintain a safe and healthy working environment
	Description	This NOS unit is about creating a Safe and Healthy work place, adhering to the safety guidelines in the working area, following practices which are not impacting the environment in a negative manner
	Scope	The role holder will be responsible for <ul style="list-style-type: none"> 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
	Performance Criteria (PC) w.r.t. the Scope	
	Element	Performance Criteria
	Identify and report the risks identified	<p>PC1. Identify activities which can cause potential injury through sharp objects, burns, fall, electricity, gas leakages, radiation, poisonous fumes, chemicals, loud noise</p> <p>PC2. Identify areas in the plant which are potentially hazardous/unhygienic in nature</p> <p>PC3. Conduct regular checks with support of the maintenance team on machine health to identify potential hazards due to wear and tear of machine</p> <p>PC4. Inform the concerned authorities about the potential risks identified in the processes, workplace area/ layout, materials used etc.</p> <p>PC5. Inform the concerned authorities about machine breakdowns, damages which can potentially harm man/ machine during operations</p> <p>PC6. Create awareness amongst other by sharing information on the identified risks</p>
	Create and sustain a Safe, clean and environment friendly work place	<p>PC7. Support the Safety team and the supervisor in creating the risk mitigation plan</p> <p>PC8. Follow the instructions given on the equipment manual describing the operating process of the equipment.</p> <p>PC9. Follow the Safety, Health and Environment related practices developed by the organization</p> <p>PC10. Ensure relevant safety board's/ signs are placed on the shop floor</p> <p>PC11. Operate the machine using the recommended Personal Protective Equipment (PPE) and ensure team members also use the related PPEs at the workplace</p> <p>PC12. Maintain a clean and safe working environment near the work place and ensure there is no spillage of chemicals, production</p>

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Maintain a safe and healthy working environment

	<p>waste, oil, solvents etc.</p> <p>PC13. Attend all safety and fire drills to be self aware of safety hazards and preventive techniques</p> <p>PC14. Maintain high standards of personal hygiene at the work place</p> <p>PC15. Ensure that the waste disposal is done in the designated area and manner as per organization SOP.</p> <p>PC16. Inform appropriately the medical officer/ HR in case of self or an employee's illness of contagious nature so that preventive actions can be planned for others</p>
Knowledge and Understanding (K)w.r.t. the scope	
Element	Knowledge and Understanding
A. Organizational Context (Knowledge of the company / organization and its processes)	<p>The user/individual on the job needs to know and understand:</p> <p>KA1. relevant standards, procedures and policies related to Health, Safety and Environment followed in the company</p> <p>KA2. emergency handling procedures & hierarchy for escalation</p>
B. Technical Knowledge	<p>The user/individual on the job needs to know and understand:</p> <p>KB1. basic knowledge of Safety procedures(fire fighting, first aid) within the organization</p> <p>KB2. knowledge of various types of PPEs and their usage</p> <p>KB3. basic knowledge of risks/hazards associated with each occupation in the organization</p> <p>KB4. how to safely operate various tools and machines and risks associated with the tools/ equipment</p> <p>KB5. knowledge of personal hygiene and how an individual can contribute towards creating a highly safe and clean working environment</p>
Skills (S)w.r.t. the scope	
Element	Skills
A. Core Skills/ Generic Skills	Writing Skills
	The user/ individual on the job needs to know and understand how to:
	SA1. write basic level notes and observations
	Reading Skills
	The user/individual on the job needs to know and understand how to:
SA2. read safety instructions put up across the plant premises	
SA3. read safety precautions mentioned in equipment manuals and panels to understand the potential risks associated	
Oral Communication (Listening and Speaking skills)	
The user/individual on the job needs to know and understand how to:	
SA4. effectively communicate information to team members	
SA5. Inform employees in the plant and concerned functions about events, incidents & potential risks observed related to Safety, Health and Environment.	

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Maintain a safe and healthy working environment

	<p>SA6. question operator/ supervisor in order to understand the safety related issues</p> <p>SA7. attentively listen with full attention and comprehend the information given by the speaker during safety drills and training programs</p>
B. Professional Skills	Judgmental Thinking
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB1. use common sense and make judgments during day to day basis</p> <p>SB2. use reasoning skills to identify and resolve basic problems</p>

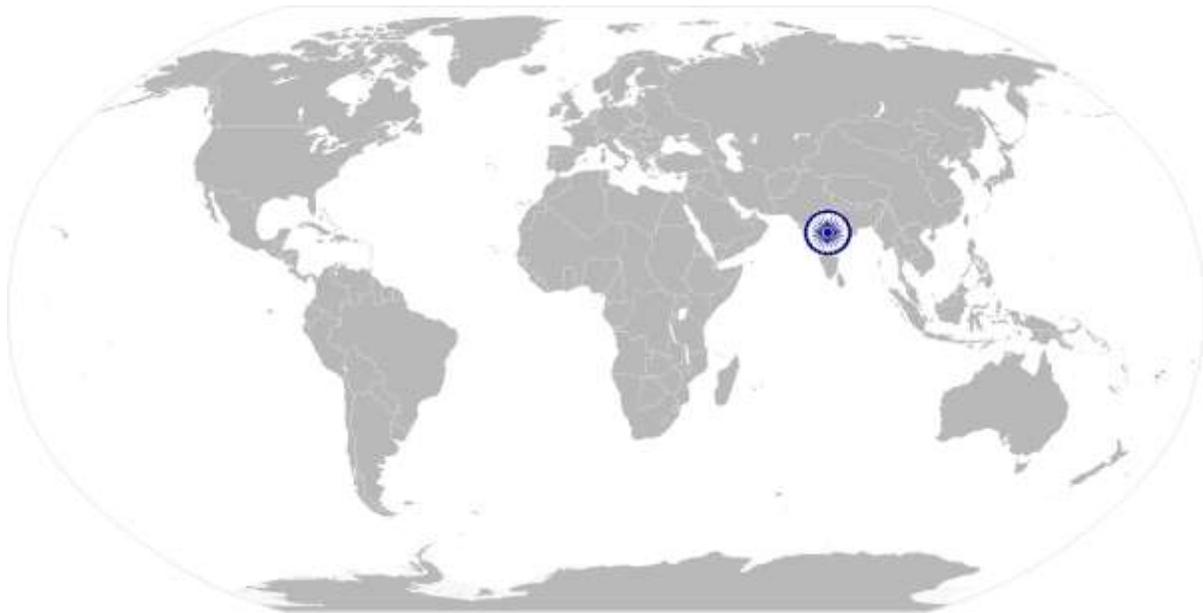
NOS Version Control

NOS Code	ASC/N0006A		
Credits(NSQF)	TBD	Version number	1.0
Industry	Automotive	Drafted on	15/8/2013
Industry Sub-sector	R & D	Last reviewed on	25/8/2013
Occupation	Testing	Next review date	Under revision expected date of revised version 31-Dec-15

ASC/N0021

Maintaining 5S at the work premises

National Occupational Standard



Overview

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

ASC/N0021

Maintaining 5S at the work premises

National Occupational Standard	Unit Code	ASC/N0021
	Unit Title (Task)	Maintaining 5S at the work premises
	Description	This NOS is about ensuring all 5 S activities both at the shop floor and the office area to facilitate increase in work productivity
	Scope	The individual needs to <ul style="list-style-type: none"> Ensure sorting, streamlining & organizing, storage and documentation, cleaning, standardization and sustenance across the plant and office premises of the organization
	Performance Criteria (PC) w.r.t. the Scope	
	Element	Performance Criteria
	Ensure sorting	<p>PC1. Follow the sorting process and check that the tools, fixtures & jigs that are lying on workstations are the ones in use and un-necessary items are not cluttering the workbenches or work surfaces.</p> <p>PC2. Ensure segregation of waste in hazardous/ non Hazardous waste as per the sorting work instructions</p> <p>PC3. Follow the technique of waste disposal and waste storage in the proper bins as per SOP</p> <p>PC4. Segregate the items which are labeled as red tag items for the process area and keep them in the correct places</p> <p>PC5. Sort the tools/ equipment/ fasteners/ spare parts as per specifications/ utility into proper trays, cabinets, lockers as mentioned in the 5S guidelines/ work instructions</p> <p>PC6. Ensure that areas of material storage areas are not overflowing</p> <p>PC7. Properly stack the various types of boxes and containers as per the size/ utility to avoid any fall of items/ breakage and also enable easy sorting when required</p> <p>PC8. Return the extra material and tools to the designated sections and make sure that no additional material/ tool is lying near the work area</p> <p>PC9. Follow the floor markings/ area markings used for demarcating the various sections in the plant as per the prescribed instructions and standards</p>
	Ensure proper documentation and storage (organizing, streamlining)	<p>PC10. Follow the proper labeling mechanism of instruments/ boxes/ containers and maintaining reference files/ documents with the codes and the lists</p> <p>PC11. Check that the items in the respective areas have been identified as broken or damaged</p> <p>PC12. Follow the given instructions and check for labeling of fluids, oils. Lubricants, solvents, chemicals etc. and proper storage of the same to avoid spillage, leakage, fire etc.</p> <p>PC13. Make sure that all material and tools are stored in the designated</p>

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	places and in the manner indicated in the 5S instructions
Ensure cleaning of self and the work place	<p>PC14. Check whether safety glasses are clean and in good condition</p> <p>PC15. Keep all outside surfaces of recycling containers are clean</p> <p>PC16. Ensure that the area has floors swept, machinery clean and generally clean. In case of cleaning, ensure that proper displays are maintained on the floor which indicate potential safety hazards</p> <p>PC17. Check whether all hoses, cabling & wires are clean, in good condition and clamped to avoid any mishap or mix up</p> <p>PC18. Ensure workbenches and work surfaces are clean and in good condition</p> <p>PC19. Follow the cleaning schedule for the lighting system to ensure proper illumination</p> <p>PC20. Store the cleaning material and equipment in the correct location and in good condition</p> <p>PC21. Ensure self-cleanliness - clean uniform, clean shoes, clean gloves, clean helmets, personal hygiene</p>
Ensure sustenance	<p>PC1. Follow the daily cleaning standards and schedules to create a clean working environment</p> <p>PC2. Attend all training programs for employees on 5 S</p> <p>PC3. Support the team during the audit of 5 S</p> <p>PC4. Participate actively in employee work groups on 5S and encourage team members for active participation</p> <p>PC5. Follow the guidelines for What to do and What not to do to build sustainability in 5S as mentioned in the 5S check lists/ work instructions</p>
Knowledge and Understanding (K) w.r.t. the scope	
Element	Knowledge and Understanding
C. Organizational Context (Knowledge of the company / organization and its processes)	<p>The user/individual on the job needs to know and understand:</p> <p>KA3. relevant standards, procedures and policies related to 5S followed in the company</p>
D. Technical Knowledge	<p>The user/individual on the job needs to :</p> <p>KB6. have basic knowledge of 5S procedures</p> <p>KB7. know various types 5s practices followed in various areas</p> <p>KB8. understand the 5S checklists provided in the department/ team</p> <p>KB9. have skills to identify useful & non useful items</p> <p>KB10. have knowledge of labels , signs & colours used as indicators</p> <p>KB11. Have knowledge on how to sort and store various types of tools, equipment, material etc.</p> <p>KB12. know , how to identify various types of waste products</p> <p>KB13. understand the impact of waste/ dirt/ dust/unwanted substances on the process/ environment/ machinery/ human</p>

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	<p>body</p> <p>KB14. have knowledge of best ways of cleaning & waste disposal</p> <p>KB15. understand the importance of standardization in processes</p> <p>KB16. understand the importance of sustainability in 5S</p> <p>KB17. have knowledge of TQM process</p> <p>KB18. have knowledge of various materials and storage norms</p> <p>KB19. understand visual controls, symbols, graphs etc.</p>
Skills (S)w.r.t. the scope	
Element	Skills
C. Core Skills/ Generic Skills	Writing Skills
	The user/ individual on the job needs to know and understand how to: SA8. write basic level notes and observations SA9. note down observations (if any) related to the process SA10. write information documents to internal departments/ internal teams
	Reading Skills
	The user/individual on the job needs to know and understand how to: SA11. read 5S instructions put up across the plant premises
	Oral Communication (Listening and Speaking skills)
	The user/individual on the job needs to know and understand how to: SA12. effectively communicate information to team members inform employees in the plant and concerned functions about 5S SA13. question the process head in order to understand the 5S related issues SA14. attentively listen with full attention and comprehend the information given by the speaker during 5S training programs
D. Professional Skills	Judgmental Thinking
	The user/individual on the job needs to know and understand how to: SB3. use common sense and make judgments during day to day basis SB4. use reasoning skills to identify and resolve basic problems using 5S
	Persuasion
	The user/ individual on the jobs needs to know and understand how to: SB5. persuade co team members to follow 5 S SB6. ensure that the co team members understand the importance of using 5 S tool
	Creativity

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

NOS Version Control

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

Qualification Pack for Test Technician

Criteria for assessment of Trainees

JOB ROLE	Test Technician
Qualification Pack	ASC/Q 8401
No. Of NOS	2 Role specific ,2 generic

NOS Title/ NOS Elements	NOS & Performance Criterion Description	Theory	Marks allocation	
			Viva	Practical
ASC/N 8401	Understand the testing requirement for laboratory testing of aggregates and vehicles and conduct on road testing of automobiles			
Understand the testing requirements, test equipment and parameters to be checked during the test procedure	PC1. Understand the type of test which needs to be conducted on the component or the vehicle		20	30
	PC2. Clearly understanding the does and don'ts of the manufacturing process as defined in SOPs/ Work Instructions or defined by supervisors			
	PC3. Ensure understanding of the type and specification of the component or the prototype vehicle under test procedure so that the correct test equipment/ test bench can be arranged			
	PC4. Understand from the testing engineer the parameters which need to be measured during the test procedure			
	PC5. Understand the material required and the equipment availability for executing the activity			
	PC6. Ensure that the required material is procured from the store before starting the testing process – availability of greases, lubricant oil, adhesives, marking equipment, ID stickers/ labels			
	PC7. Ensure that the correct equipment is selected by the technician as per the specification and testing sheet shared by the testing engineer			
	PC8. Ensure availability of tools required for the assembly process as per the components to be assembled. Tool sizes as mentioned in the Work Instructions/ SOPs for assembly			
	PC9. Understand key joining activities like welding and soldering which may be required during the test procedure			
	PC10. Understand the various assembling			
		30	50	
		20	30	

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	<p>process parameters like cycle time, pressure, torque etc. before starting the test apparatus assembling process, as mentioned in the Work Instructions/ SOP manual</p> <p>PC11. Understand the right assembling methodology and process(Bolting, tightening, riveting, fastening, adhesive clamping, crimping etc.) for arranging the test assembly through discussions with the testing engineer and also by reading the process manuals/ Work Instructions/Standard Operating Procedures available</p> <p>PC12. Understand 5 S and Safety related aspects related to the testing process</p>			
Escalations of queries on the given job	<p>PC13. Refer the queries to a competent internal specialist/ testing engineer if they cannot be resolved by the technician on own</p> <p>PC14. Obtain help or advice from specialist if the problem is outside his/her area of competence or experience</p> <p>PC15. Confirm self-understanding with the specialist holding discussions so that all doubts & queries can be resolved before the actual process execution</p>		30	10
	subtotal		100	120
ASC/N 8402	Carry the testing process, note observations and make modifications in the test set up	Theory	Viva	Practical
Setup the test apparatus and test vehicle or component for the testing process	<p>PC1. Conduct a thorough check up of the testing equipment and the external connections for the test apparatus</p> <p>PC2. Setup the test apparatus as per the selected testing process and the internal SOPs/ Work Instructions and the setting standards for the testing machine</p> <p>PC3. Ensure that the surface of the assembling gun/ Bolting gun is cleaned to remove dust and any other impurities and application of specified tightening torque.</p> <p>PC4. Ensure that the hoists & cranes for lifting the parts are working in order as per the process requirement</p> <p>PC5. Ensure drop of sub-assemblies like frame , gear box, axles, car frame, etc. at the respective testing platforms/ benches</p>		20	50

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<p>Conduct actual test procedure under supervision of the test engineer</p>	<p>PC18. Ensure development of the test bogey for conducting the structural durability tests/ fatigue test/ stress test to be conducted in the Structure Durability Laboratory</p>			
	<p>PC19. Start/ stop the test activity as per the instructions given by the test engineer and the steps mentioned in the testing manual/ Work Instructions</p>		10	30
	<p>PC20. Support the testing engineer in taking different observations/ readings as per the parameters mentioned in the testing manual/ Work Instructions</p>			
	<p>PC21. Under supervision of the test engineer, make minor modification in the test setup/ vehicle/ component under testing to take reading under different scenarios</p>			
	<p>PC22. Observe any deviations during the test process. Observe any noise or vibrations during the testing process. Inform the testing engineer of any deviations observed</p>			
	<p>PC23. Change parts as directed by the testing engineer, fit new parts and continue the testing process under the supervision of the testing engineer</p>		20	50
	<p>PC24. Note the modifications which have been made to the original setup in order to derive comparisons between test scenarios</p>			
	<p>PC25. Make connections of the various data capturing meters and instrumentation such as load cells, pneumatic/ PLC testing gauges, strain gauges, displacement transducers, accelerometers, GPS data collection devices and data loggers to capture the data points during the vehicle running condition</p>		10	30
<p>PC26. Check all the safety features required for the vehicle under running condition are working and are checked as per the vehicle safety check list provided as per the checklist given in the testing manual</p>				
<p>PC27. Check the fuel level, oil/ lubricant level, cooling water level, tyre pressure etc. are checked before starting the on road testing of the vehicle prototype as per the checklist given in the testing manual</p>				
<p>PC28. Check for all system warning indicators</p>				

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	<p>showing system failures, loose connections, malfunctioning etc. are addressed before starting the various types of tests as per the checklist given in the testing manual.</p> <p>PC29. tabulate and record observations of phenomena, test results, data log etc.</p>			
	subtotal		130	300
ASC/N 0006	Maintain a safe and healthy working environment	Theory	Viva	Practical
Identify and report the risks identified	<p>PC1. Identify activities which can cause potential injury through sharp objects, burns, fall, electricity, gas leakages, radiation, poisonous fumes, chemicals ,loud noise</p> <p>PC2. Inform the concerned authorities about the potential risks identified in the processes, workplace area/ layout, materials used etc.</p> <p>PC3. Inform the concerned authorities about machine breakdowns, damages which can potentially harm man/ machine during operations</p> <p>PC4. Create awareness amongst other by sharing information on the identified risks</p>		20	50
Create and sustain a Safe, clean and environment friendly work place	<p>PC5. Follow the instructions given on the equipment manual describing the operating process of the equipment</p> <p>PC6. Follow the Safety, Health and Environment related practices developed by the organization</p> <p>PC7. Operate the machine using the recommended Personal Protective Equipment (PPE)</p> <p>PC8. Maintain a clean and safe working environment near the work place and ensure there is no spillage of chemicals, production waste, oil, solvents etc.</p> <p>PC9. Maintain high standards of personal hygiene at the work place</p> <p>PC10. Ensure that the waste disposal is done in the designated area and manner as per organization SOP.</p> <p>PC11. Inform appropriately the medical officer/ HR in case of self or an employee's illness of contagious nature so that preventive actions can be planned for others</p>		50	40
	subtotal		70	90
ASC / N 0021	Maintain 5S at the work premises	Theory	Viva	practical

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<p>Ensure sorting</p>	<p>PC1. Follow the sorting process and check that the tools, fixtures & jigs that are lying on workstations are the ones in use and unnecessary items are not cluttering the workbenches or work surfaces.</p> <p>PC2. Ensure segregation of waste in hazardous/ non Hazardous waste as per the sorting work instructions</p> <p>PC3. Follow the technique of waste disposal and waste storage in the proper bins as per SOP</p> <p>PC4. Segregate the items which are labeled as red tag items for the process area and keep them in the correct places</p> <p>PC5. Sort the tools/ equipment/ fasteners/ spare parts as per specifications/ utility into proper trays, cabinets, lockers as mentioned in the 5S guidelines/ work instructions</p> <p>PC6. Ensure that areas of material storage areas are not overflowing</p> <p>PC7. Properly stack the various types of boxes and containers as per the size/ utility to avoid any fall of items/ breakage and also enable easy sorting when required</p> <p>PC8. Return the extra material and tools to the designated sections and make sure that no additional material/ tool is lying near the work area</p> <p>PC9. Follow the floor markings/ area markings used for demarcating the various sections in the plant as per the prescribed instructions and standards</p>		<p>10</p> <p>10</p>	<p>20</p> <p>20</p>
<p>Ensure proper documentation and storage (organizing , streamlining)</p>	<p>PC10. Follow the proper labeling mechanism of instruments/ boxes/ containers and maintaining reference files/ documents with the codes and the lists</p> <p>PC11. Check that the items in the respective areas have been identified as broken or damaged</p> <p>PC12. Follow the given instructions and check for labeling of fluids, oils. lubricants, solvents, chemicals etc. and proper storage of the same to avoid spillage, leakage, fire etc.</p> <p>PC13. Make sure that all material and tools are stored in the designated places and in the manner indicated in the 5S instructions</p>		<p>10</p>	<p>20</p>
<p>Ensure sustenance</p>	<p>PC14. Follow the daily cleaning standards and schedules to create a clean working environment</p>			

Qualification Pack for Test Technician

	PC15. Attend all training programs for employees on 5 S PC16. Support the team during the audit of 5 S PC17. Participate actively in employee work groups on 5S and encourage team members for active participation PC18. Follow the guidelines for What to do and What not to do to build sustainability in 5S as mentioned in the 5S check lists/ work instructions		20	30
	Sub total		50	90
	Total	390	350	600