

Manager Heat Treatment/Metallurgist

QP Code: ASC/Q3903

NSQF Level: 6

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Qualification Pack

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ASC/Q3903: Manager Heat Treatment/Metallurgist

Brief Job Description

This role is responsible for supervising the various heat treatment operations like Carburizing, Tempering, Nitriding, Induction Hardening and Quenching, maintaining process & output parameters viz. Temperature, cycle time, bath concentrations & hardness, strength, microstructure, , guiding operatives and technicians to complete the assigned task, maintaining a safe & healthy working environment on the shop floor and maintaining records related to production, rejections, material movement and manpower productivity for a line/shift.

Personal Attributes

Technical knowledge of Heat Treatment processes and metallurgy, reading, writing and communication skills, ability to plan and prioritize, quality consciousness, analytical thinking, sensitivity to problem solving, quick decision making, safety orientation, dexterity and high precision, ability to use internal ERP systems (if existing), managing teams, grievance management, listening skills, ability to train team members.

Applicable National Occupational Standards (NOS)

Compulsory NOS:

1. [ASC/N0006: Maintain a safe and healthy working environment](#)
2. [ASC/N0016: Understanding process requirements, ensuring process implementation & suggesting process improvement initiatives](#)
3. [ASC/N0017: Manage the production related operations of the shift/line on a day to day basis](#)
4. [ASC/N0018: Managing the team on the line/shift on a day to day basis](#)
5. [ASC/N0022: Ensure implementation of 5S activities at the shop floor & the office area](#)
6. [ASC/N3906: Manage various heat treatment operations like carburizing, tempering, induction hardening, quenching and washing, set the furnace and train the team](#)

Qualification Pack (QP) Parameters

Sector	Automotive
Sub-Sector	Manufacturing
Occupation	Heat Treatment
Country	India

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NSQF Level	6
Aligned to NCO/ISCO/ISIC Code	NCO-2015/2146.0501
Minimum Educational Qualification & Experience	Graduate (chemistry) with 10-15 Years of experience Heat Treatment/Furnace Operations (ITI Background) OR Graduate (chemistry) with 3-5 Years of experience Heat Treatment/Furnace Operations (diploma background) OR Graduate (chemistry)
Minimum Level of Education for Training in School	
Pre-Requisite License or Training	Latest heat treatment techniques available in the market 5S and Safety aspects Problem Solving Techniques Quality Management Systems Team Management skills IT and ERP awareness
Minimum Job Entry Age	18 Years
Last Reviewed On	25/12/2013
Next Review Date	31/03/2020
NSQC Approval Date	05/08/2015
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/N0016: Understanding process requirements, ensuring process implementation & suggesting process improvement initiatives

Description

This NOS unit is about understanding for the required processes, drafting first level process manuals, ensuring implementation of processes and providing inputs for process improvement through deploying different tools/ participating in problem analysis

Scope

The role will be responsible for understanding the required processes and ensuring implementation first level design of process improvement initiatives implementation of initiatives on the shop floor The job holder will cover all types of manufacturing processes in the automobile industry. The role holder will interact with the different manufacturing process teams, maintenance team, material management team, industrial engineering team, Quality Control & Assurance team, Safety team and HR/IR team

- understanding the required processes and ensuring implementation
- first level design of process improvement initiatives
- implementation of initiatives on the shop floor

Elements and Performance Criteria

Understanding all the requisite processes in detail and ensuring implementation

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

- PC1.** . display detailed understanding of all the requisite processes to be adopted for completing the work order through reading the process manuals/ work instructions/standard operating procedures for the production job
- PC2..** ensure first level drafting of process manuals, work instructions, control plans, process flow charts to enable the team to easily understand and implement the process
- PC3. .** ensure proper display of work instructions, control plans and flow charts at the correct places on the shop floor to enable timely and proper view of the documents
- PC4. .** share knowledge of processes , inputs and outputs with the operators and in order to enhance their skill levels
- PC5..** maintain work flow by monitoring steps of the processes, setting variables, observing control points and equipment
- PC6. .** monitor various process parameters on a regular basis and ensure compliance to agreed standards (e.g. ambient air quality, stack monitoring, water quality monitoring etc.)
- PC7. .** ensuring recording and reporting procedures and systems are in place
- PC8. .** facilitating corrections to malfunctions within process control points
- PC9. .** ensure that all the tools and measuring instruments used on the shop floor are inspected, tested and calibrated internally/ externally as per the schedule
- PC10. .** support the shop head/ process head in arranging for the requisite usage certificates for the tools and equipment as per the internal guidelines of the organization

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- PC11..** ensure 5s implementation in the production line by analysing possible areas of systems and process improvements and ensure implementation of the recommended measures to address the gaps
- PC12..** ensure successful implementation of the completed poka yoke and kaizen on the running line
- PC13..** support the shop head/ process manager in conducting first level audit of the manufacturing process on the shop floor

Process Improvement

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

- PC14. .** ensure optimum resource utilization and wastage reduction through process improvements, kaizens, TQM, Poka Yoke etc. in the shift
- PC15. .** provide inputs for analysis of breakdown trends and current maintenance process to identify areas for improvement to achieve cost savings and reduce breakdown timing
- PC16..** identify areas of improvement in the existing processes/systems and take measures to adhere to the identified kaizen/ process improvement initiatives
- PC17. .** ensure inputs from the line operators are considered while designing for various poka yoke , kaizen initiatives
- PC18. .** encourage team members/ supervisor/ operators to suggest quality improvement measures through suggestion schemes, evaluate feasibility of the ideas and discuss their implementation with seniors
- PC19..** support in analysing internal & external rejection data, planning and ensuring implementation of the corrective measures
- PC20. .** ensure team has understanding of basic analytical tools like why why analysis, 7 QC tools, TQM principles to analyse various problems and design process improvement activities
- PC21. .** support the process engineering/ industrial engineering team in modifications of the process flow, process/ plant layout to improve the process TAT, operational ergonomics, work quality etc.

Implementation of various initiatives

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

- PC22..** take overall responsibility to ensure adherence to safety standards by all employees and establish zero accident practice in the section
- PC23..** implement various business excellence techniques like kaizen, 5s initiatives, etc. to enhance productivity for the plant/ shift

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** relevant manufacturing standards and procedures followed in the company in detail
- KU2.** different types of products manufactured by the company
- KU3.** knowledge of functional processes like Procurement, Store management, inventory management, quality management and key contact points for query resolution
- KU4.** quality norms and standards prescribed in the Quality Manual by the organization for painting
- KU5.** 5S and Safety norms practiced in the organization

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- KU6.** different types of manufacturing processes used
- KU7.** requirement of raw materials used in the process
- KU8.** about tools, jigs and fixtures , their usage and maintenance methods
- KU9.** how to operate the machine in both, automatic and manual mode
- KU10.** basic understanding of robotics, CNC operations, data acquisitions systems, automatic recording instruments
- KU11.** using engineering drawings, sketches, control plan and work instructions in the plant
- KU12.** usage of various measurement tools like Vernier Calipers, Micrometres, rulers, scales, weighing machines etc
- KU13.** basic arithmetic and calculation methods
- KU14.** how to handle electrical equipment and circuits, rectifiers and control panel etc.
- KU15.** different types of defects which may arise due to improper manufacturing and the impact of the defect on product performance
- KU16.** metallurgical and chemical properties of material involved
- KU17.** how to measure the correct specifications of the output in the terms of thickness, hardness, durability, tightness, finesse etc.
- KU18.** . various problems solving tools like 7QC, Why Why Analysis, Brain storming etc.
- KU19.** key areas of power consumption/ steam consumption, compressed air consumption etc
- KU20.** various data entry tools and formats used in the organization
- KU21.** ability to visualize the final product output and hence decide on the key steps and parameters to be followed
- KU22.** usage of various business correspondence tools like Email, MS Office tools (Word, Excel, Power Point) etc.
- KU23.** about the various hazards related to various chemicals if used in the processes, the hazards involved in the process operations and usage of PPEs

Generic Skills (GS)

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

- GS1.** create first level process manuals, Control Plans, Work Instructions in a manner that the operators can easily understand the process requirements and process steps
- GS2.** create small notes/ work documents/ diagrams for supervisors ,operators and helpers to help them understand the process
- GS3.** use emails and other business correspondence methods (internal memos, circular etc.) for communicating with other team members/ vendors/ suppliers etc.
- GS4.** read equipment manuals and process documents given by the equipment supplier to understand the equipment and processes better
- GS5.** discuss task lists, schedules, and work-loads with the operative team members
- GS6.** effectively explain supervisors, operators and helpers about equipment operations, process steps and other operational requirements
- GS7.** answer the queries raised by the operative team as well as intercompany departments
- GS8.** effectively communicate with the operators and helpers and make them aware of work expectations, targets, policies, processes etc.

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- GS9.** attentively listen with full attention the queries and grievances raised by the operative team and comprehend the information given by the speaker
- GS10.** communicate effectively to the team members
- GS11.** identify conflicts in the team and try to resolve them at the earliest
- GS12.** interact and engage with the team members on a day to day basis
- GS13.** counsel and coach the operators and help them resolve issues
- GS14.** timely highlight to the management about any good work/ achievement by the operators and helper
- GS15.** break the problem into smaller issues and tasks to arrive at a solution
- GS16.** understand inter process relationship and establish relationship between various parts of the problem
- GS17.** leverage experience to find effective solutions to problems
- GS18.** use basic analytical tools to arrive at solutions
- GS19.** plan, organize and prioritize the work order and jobs received from the production manager
- GS20.** manage the schedule plan for the operators and helpers on the line/shift
- GS21.** validate all process/ equipment manuals so that the final process selected is correct
- GS22.** organize information, tools, manuals etc. on the shop floor so that sorting becomes easy
- GS23.** reorganize resources on the line/ shift in case of change of plans
- GS24.** use common sense and make judgments during day to day basis
- GS25.** use reasoning skills to identify and resolve problems
- GS26.** use intuition to detect any potential problems which could arise during operations
- GS27.** critically analyse solutions/ recommendations shared by operatives and supervisors for implementation
- GS28.** accept additional responsibility for self and the team
- GS29.** encourage self and other to take greater responsibilities
- GS30.** ensure that the work allocated to the team is completed as per timelines and quality norms
- GS31.** identify obstacles and bottlenecks in the process and on own find basic level solutions for removing these obstacles
- GS32.** motivate and provide support for the team on the shop floor
- GS33.** encourage collaboration between team members
- GS34.** resolve team issues and grievances to manage conflicts within the team
- GS35.** create an environment of approachability, trust and openness within the team
- GS36.** ensure role clarity for all operators and helpers on the line/ shift
- GS37.** escalate any team related issues to the concerned person at the right time
- GS38.** identify defective parts in the manufacturing line by comparing manufactured pieces with the work standard
- GS39.** link the defect observed with the overall impact on the performance of the component/ automobile
- GS40.** support and contribute in monitoring and delivering high quality output from self and others
- GS41.** train team members on maintaining quality standards set by the organization
- GS42.** use previous experience in resolving problems and taking decisions

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- GS43.** make timely and independent decisions on the line/ shift within the boundaries of the delegation matrix of the organization
- GS44.** familiarise with leading practices available in the market
- GS45.** think independently on new approaches to manufacturing process, material management, data management and team management
- GS46.** represent any new ideas/ approaches on process improvement and productivity improvement to the seniors in the team

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Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Understanding all the requisite processes in detail and ensuring implementation</i>	18	43	-	-
PC1. . display detailed understanding of all the requisite processes to be adopted for completing the work order through reading the process manuals/ work instructions/standard operating procedures for the production job	2	3	-	-
PC2.. ensure first level drafting of process manuals, work instructions, control plans, process flow charts to enable the team to easily understand and implement the process	2	3	-	-
PC3. . ensure proper display of work instructions, control plans and flow charts at the correct places on the shop floor to enable timely and proper view of the documents	1	3	-	-
PC4. . share knowledge of processes , inputs and outputs with the operators and in order to enhance their skill levels	2	3	-	-
PC5.. maintain work flow by monitoring steps of the processes, setting variables, observing control points and equipment	2	4	-	-
PC6. . monitor various process parameters on a regular basis and ensure compliance to agreed standards (e.g. ambient air quality, stack monitoring, water quality monitoring etc.)	2	4	-	-
PC7. . ensuring recording and reporting procedures and systems are in place	1	3	-	-
PC8. . facilitating corrections to malfunctions within process control points	1	4	-	-
PC9. . ensure that all the tools and measuring instruments used on the shop floor are inspected, tested and calibrated internally/ externally as per the schedule	1	4	-	-

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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC10. . support the shop head/ process head in arranging for the requisite usage certificates for the tools and equipment as per the internal guidelines of the organization	1	3	-	-
PC11.. ensure 5s implementation in the production line by analysing possible areas of systems and process improvements and ensure implementation of the recommended measures to address the gaps	1	3	-	-
PC12.. ensure successful implementation of the completed poka yoke and kaizen on the running line	1	3	-	-
PC13.. support the shop head/ process manager in conducting first level audit of the manufacturing process on the shop floor	1	3	-	-
<i>Process Improvement</i>	10	21	-	-
PC14. . ensure optimum resource utilization and wastage reduction through process improvements, kaizens, TQM, Poka Yoke etc. in the shift	1	3	-	-
PC15. . provide inputs for analysis of breakdown trends and current maintenance process to identify areas for improvement to achieve cost savings and reduce breakdown timing	2	3	-	-
PC16.. identify areas of improvement in the existing processes/systems and take measures to adhere to the identified kaizen/ process improvement initiatives	1	3	-	-
PC17. . ensure inputs from the line operators are considered while designing for various poka yoke , kaizen initiatives	1	2	-	-
PC18. . encourage team members/ supervisor/ operators to suggest quality improvement measures through suggestion schemes, evaluate feasibility of the ideas and discuss their implementation with seniors	1	2	-	-
PC19.. support in analysing internal & external rejection data, planning and ensuring implementation of the corrective measures	1	3	-	-

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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC20. . ensure team has understanding of basic analytical tools like why why analysis, 7 QC tools, TQM principles to analyse various problems and design process improvement activities	2	3	-	-
PC21. . support the process engineering/ industrial engineering team in modifications of the process flow, process/ plant layout to improve the process TAT, operational ergonomics, work quality etc.	1	2	-	-
<i>Implementation of various initiatives</i>	2	6	-	-
PC22.. take overall responsibility to ensure adherence to safety standards by all employees and establish zero accident practice in the section	1	3	-	-
PC23.. implement various business excellence techniques like kaizen, 5s initiatives, etc. to enhance productivity for the plant/ shift	1	3	-	-
NOS Total	30	70	-	-

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National Occupational Standards (NOS) Parameters

NOS Code	ASC/N0016
NOS Name	Understanding process requirements, ensuring process implementation & suggesting process improvement initiatives
Sector	Automotive
Sub-Sector	Manufacturing
Occupation	Welding
NSQF Level	6
Credits	TBD
Version	1.0
Last Reviewed Date	28/12/2013
Next Review Date	28/12/2015
NSQC Clearance Date	

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ASC/N0017: Manage the production related operations of the shift/line on a day to day basis

Description

This NOS is about ensuring Operational Productivity

Scope

The role will be responsible for managing operations in the shift/ Process manpower and material management in the shift/ process ensure conformance to quality parameters and norms analyse data on production, maintenance, quality, manpower deployment etc. The job holder will cover all types of manufacturing processes in the automobile industry. The role holder will interact with the different manufacturing process teams, maintenance team, material management team, industrial engineering team, Quality Control & Assurance team, Safety team and HR/IR team

- managing operations in the shift/ Process
- manpower and material management in the shift/ process
- ensure conformance to quality parameters and norms
- analyse data on production, maintenance, quality, manpower deployment etc.

Elements and Performance Criteria

Manpower Management

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

- PC1..** undertake effective shift planning based on manpower allocation and shift handling of place right manpower on the right workstation in coordination with production in-charge to achieve production targets
- PC2..** support the shop head/ process head in finalizing the shift rosters for the week and month based on the production plan available

Material Management

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

- PC3..** send inventory requirements to stores and purchase department and follow up with stores and purchase to ensure timely receipt of material (spares, consumables)
- PC4..** ensure that the incoming raw material quality is inspected and meets the production requirement
- PC5. .** ensure that the material and work piece movement on the shop floor conforms to the TAT time prescribed in the SOP/ work plans so that production targets are met for the line/ shift

Supervise Production Operations

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

- PC6. .** ensure that the production plan shared by the ppc team is fulfilled during the shift/ across lines
- PC7. .** coordinate with various functions like material management, stores, paint shop, assembly line, quality, safety, production planning etc. to ensure communication of required information and resolution of queries

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- PC8..** responsible for end of line inspection under supervision
- PC9..** ensure that the operators and helpers have the required tools and equipment at the start of the process
- PC10..** identify & implement action steps to reduce losses and wastages during shift operation and ensure minimum rejection of components
- PC11. .** observe and note the consumption of energy, fuel, steam on the production line and utilize these inputs for optimization of various factors of production
- PC12. .** support the maintenance team in finalizing the preventive maintenance schedule for the shop
- PC13..** ensure that the operator and helper are using the required personal protective equipment like goggles, masks, gloves and other ppes at the time of conducting the painting operation

Conformance to Product and Process Quality

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

- PC14..** conduct random incoming quality inspection of material and provide the relevant feedback on the same to the store
- PC15..** conduct quality inspection of the process parameters, lab parameters and wip products and provide necessary feedback to the line leaders
- PC16..** conduct quality inspection of the first sample/batch to ensure that the quality of the product produced meet customer requirements
- PC17..** conduct inspection and analysis of the defects observed in the process and products

Data Collation and Analysis

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

- PC18..** prepare daily and monthly production mis reports to match actual performance vis--vis the targets and report the same to production in-chart
- PC19..** verify the production and material movement related data entries in the system (manual/ erp) for the shift and ensure correctness of the data
- PC20..** ensure compilation of data of breakdown maintenance and reporting the same to the maintenance team
- PC21..** collaborate with the maintenance team in conducting detailed breakdown analysis to understand problems, look out for process/ machine modifications and resolve the issues
- PC22..** conduct random sampling of the process parameters, finished goods and WIP products and provide necessary feedback to the line leaders
- PC23..** collaborate with the quality management and inspection team in conducting detailed analysis to resolve issues
- PC24..** collaborate with various supervisors to capture process data points as mentioned in the internal operating guidelines for data analytics
- PC25..** support the shop head/ process head in analysing the various data points related to production, maintenance, manpower deployment, material management, costs etc.
- PC26..** support the shop head/ process head in creating various analytical presentations required for process/ shop/ plant review

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

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- KU1.** relevant manufacturing standards and procedures followed in the company in detail
- KU2.** different types of products manufactured by the company
- KU3.** knowledge of functional processes like Procurement, Store management, inventory management, quality management and key contact points for query resolution
- KU4.** quality norms and standards prescribed in the Quality Manual by the organization for painting
- KU5.** 5S and Safety norms practiced in the organization
- KU6.** different types of manufacturing processes
- KU7.** requirement of raw materials used in the process
- KU8.** about tools, jigs and fixtures , their usage and maintenance
- KU9.** how to operate both in automatic and manual mode
- KU10.** basic understanding of robotics, CNC operations, data acquisitions systems, automatic recording instruments
- KU11.** different types of defects which may arise due to improper manufacturing
- KU12.** basic Arithmetic and calculation methods
- KU13.** ability to visualize the final product output and hence decide on the key steps to be followed
- KU14.** about handling of electrical equipment and circuits, rectifiers and control panel etc
- KU15.** metallurgical and chemical properties of the material under usage
- KU16.** how to measure the correct specifications of the output in the terms of thickness, hardness, durability, tightness etc
- KU17.** how to visualize the final product output and hence decide on the parameters of temperature, pressure, current and voltage
- KU18.** various problems solving tools like 7QC, Why Why Analysis, Brain storming
- KU19.** usage of various business correspondence tools like Email, MS Office tools (Word, Excel, Power Point) etc.
- KU20.** about the various hazards related to various chemicals if used in the processes, the hazards involved in the process operations and usage of PPEs

Generic Skills (GS)

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

- GS1.** create first level process manuals, Control Plans, Work Instructions in a manner that the operators can easily understand the process requirements and process steps
- GS2.** create small notes/ work documents/ diagrams for supervisors ,operators and helpers to help them understand the process
- GS3.** use emails and other business correspondence methods (internal memos, circular etc.) for communicating with other team members/ vendors/ suppliers etc.
- GS4.** read equipment manuals and process documents given by the equipment supplier to understand the equipment and processes better
- GS5.** discuss task lists, schedules, and work-loads with the operative team members
- GS6.** effectively explain supervisors, operators and helpers about equipment operations, process steps and other operational requirements

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- GS7.** answer the queries raised by the operative team as well as intercompany departments
- GS8.** effectively communicate with the operators and helpers and make them aware of work expectations, targets, policies, processes etc.
- GS9.** attentively listen with full attention the queries and grievances raised by the operative team and comprehend the information given by the speaker
- GS10.** communicate effectively to the team members
- GS11.** identify conflicts in the team and try to resolve them at the earliest
- GS12.** interact and engage with the team members on a day to day basis
- GS13.** counsel and coach the operators and help them resolve issues
- GS14.** timely highlight to the management about any good work/ achievement by the operators and helpers
- GS15.** identify problems occurring on the shop floor
- GS16.** break the problem into smaller issues and tasks to arrive at a solution
- GS17.** understand inter process relationship and establish relationship between various parts of the problem
- GS18.** leverage experience and technical expertise to find effective solutions to problems
- GS19.** use basic analytical tools to arrive at solutions
- GS20.** collaborate with cross functional teams to resolve problems
- GS21.** plan, organize and prioritize the work order and jobs received from the production manager
- GS22.** manage the schedule plan for the operators and helpers on the line/shift
- GS23.** validate all process/ equipment manuals so that the final process selected is correct
- GS24.** organize information, tools, manuals etc. on the shop floor so that sorting becomes easy
- GS25.** reorganize resources on the line/ shift in case of change of plans
- GS26.** use common sense and make judgments during day to day basis
- GS27.** use reasoning skills to identify and resolve problems
- GS28.** use intuition to detect any potential problems which could arise during operations
- GS29.** critically analyse solutions/ recommendations shared by operatives and supervisors for implementation
- GS30.** accept additional responsibility for self and the team
- GS31.** encourage self and other to take greater responsibilities
- GS32.** ensure that the work allocated to the team is completed as per timelines and quality norms
- GS33.** identify obstacles and bottlenecks in the process and on own find basic level solutions for removing these obstacles
- GS34.** motivate and provide support for the team on the shop floor
- GS35.** encourage collaboration between team members
- GS36.** resolve team issues and grievances to manage conflicts within the team
- GS37.** create an environment of approachability, trust and openness within the team
- GS38.** ensure role clarity for all operators and helpers on the line/ shift
- GS39.** escalate any team related issues to the concerned person at the right time
- GS40.** identify defective parts in the manufacturing line by comparing
- GS41.** manufactured pieces with the work standard

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- GS42.** link the defect observed with the overall impact on the performance of the component/ automobile
- GS43.** support and contribute in monitoring and delivering high quality output from self and others
- GS44.** train team members on maintaining quality standards set by the organization
- GS45.** use previous experience in resolving problems and taking decisions
- GS46.** make timely and independent decisions on the line/ shift within the boundaries of the delegation matrix of the organization
- GS47.** familiarise with leading practices available in the market
- GS48.** think independently on new approaches to manufacturing process, material management, data management and team management
- GS49.** represent any new ideas/ approaches on process improvement and productivity improvement to the seniors in the team

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Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Manpower Management</i>	2	4	-	-
PC1.. undertake effective shift planning based on manpower allocation and shift handling of place right manpower on the right workstation in coordination with production in-charge to achieve production targets	1	2	-	-
PC2.. support the shop head/ process head in finalizing the shift rosters for the week and month based on the production plan available	1	2	-	-
<i>Material Management</i>	3	8	-	-
PC3.. send inventory requirements to stores and purchase department and follow up with stores and purchase to ensure timely receipt of material (spares, consumables)	1	2	-	-
PC4.. ensure that the incoming raw material quality is inspected and meets the production requirement	1	3	-	-
PC5. . ensure that the material and work piece movement on the shop floor conforms to the TAT time prescribed in the SOP/ work plans so that production targets are met for the line/ shift	1	3	-	-
<i>Supervise Production Operations</i>	10	24	-	-
PC6. . ensure that the production plan shared by the ppc team is fulfilled during the shift/ across lines	1	3	-	-
PC7. . coordinate with various functions like material management, stores, paint shop, assembly line, quality, safety, production planning etc. to ensure communication of required information and resolution of queries	1	3	-	-
PC8.. responsible for end of line inspection under supervision	1	3	-	-
PC9.. ensure that the operators and helpers have the required tools and equipment at the start of the process	1	3	-	-

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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC10.. identify & implement action steps to reduce losses and wastages during shift operation and ensure minimum rejection of components	2	3	-	-
PC11. . observe and note the consumption of energy, fuel, steam on the production line and utilize these inputs for optimization of various factors of production	2	3	-	-
PC12. . support the maintenance team in finalizing the preventive maintenance schedule for the shop	1	3	-	-
PC13.. ensure that the operator and helper are using the required personal protective equipment like goggles, masks, gloves and other ppes at the time of conducting the painting operation	1	3	-	-
<i>Conformance to Product and Process Quality</i>	6	12	-	-
PC14.. conduct random incoming quality inspection of material and provide the relevant feedback on the same to the store	2	3	-	-
PC15.. conduct quality inspection of the process parameters, lab parameters and wip products and provide necessary feedback to the line leaders	2	3	-	-
PC16.. conduct quality inspection of the first sample/batch to ensure that the quality of the product produced meet customer requirements	1	3	-	-
PC17.. conduct inspection and analysis of the defects observed in the process and products	1	3	-	-
<i>Data Collation and Analysis</i>	9	22	-	-
PC18.. prepare daily and monthly production mis reports to match actual performance vis--vis the targets and report the same to production in-chart	1	3	-	-
PC19.. verify the production and material movement related data entries in the system (manual/ erp) for the shift and ensure correctness of the data	1	3	-	-
PC20.. ensure compilation of data of breakdown maintenance and reporting the same to the maintenance team	1	3	-	-

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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC21.. collaborate with the maintenance team in conducting detailed breakdown analysis to understand problems, look out for process/ machine modifications and resolve the issues	1	2	-	-
PC22.. conduct random sampling of the process parameters, finished goods and WIP products and provide necessary feedback to the line leaders	1	3	-	-
PC23.. collaborate with the quality management and inspection team in conducting detailed analysis to resolve issues	1	2	-	-
PC24.. collaborate with various supervisors to capture process data points as mentioned in the internal operating guidelines for data analytics	1	2	-	-
PC25.. support the shop head/ process head in analysing the various data points related to production, maintenance, manpower deployment, material management, costs etc.	1	2	-	-
PC26.. support the shop head/ process head in creating various analytical presentations required for process/ shop/ plant review	1	2	-	-
NOS Total	30	70	-	-

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National Occupational Standards (NOS) Parameters

NOS Code	ASC/N0017
NOS Name	Manage the production related operations of the shift/line on a day to day basis
Sector	Automotive
Sub-Sector	Manufacturing
Occupation	Welding
NSQF Level	6
Credits	TBD
Version	1.0
Last Reviewed Date	28/12/2013
Next Review Date	28/12/2015
NSQC Clearance Date	

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ASC/N0018: Managing the team on the line/shift on a day to day basis

Description

This NOS unit is about managing the team of operatives and helpers on day to day basis, ensuring their shift deployment, motivating them by involving them in various engagement initiatives at the shop floor, helping them improve the skills levels and managing their grievances in the best possible manner in order to maximize the people productivity at the shop floor

Scope

The role will be responsible for engaging the workforce through employee engagement and communication finalizing manpower deployment measuring operator performance, sharing feedback and training of helpers and operators managing grievances of the team members The job holder will cover all types of manufacturing processes in the automobile industry. The role holder will interact with the different manufacturing process teams, maintenance team, material management team, industrial engineering team, Quality Control & Assurance team, Safety team and HR/IR team

- engaging the workforce through employee engagement and communication
- finalizing manpower deployment
- measuring operator performance, sharing feedback and training of helpers and operators
- managing grievances of the team members

Elements and Performance Criteria

Engaging the shop floor work force through employee communication and employee engagement

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

- PC1.** . ensure operators and helpers on the production line/ shift are aware of the job expectations on a daily basis
- PC2.** . ensure that the operators are aware of the production targets and the timelines required to process a work order as finalized in the production plan
- PC3..** involve operators and helpers for the daily floor meeting/ morning meetings/ staff meetings to communicate information intended for them
- PC4.** . ensure communication to line operators/ helpers on any changes in policies/ processes by the organization through required verbal/ written mechanisms
- PC5.** . ensure participation of employees in various engagement initiatives organized at the plant and other place by the organization
- PC6.** . involve operators and helpers in Quality Circles, TQM & kaizen meets, brainstorming sessions, safety drills etc. to increase their involvement in manufacturing operations
- PC7.** . ensure availability of tea, snacks, drinking water and basic hygiene facilities at the shop floor for the operative workforce.
- PC8..** escalate issues to concerned staff in case of any issue related to operative deployment and engagement
- PC9.** . ensure employees at the shop floor are motivated and their concerns are resolved

Finalizing manpower deployment

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

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- PC10.** . finalize along with the process manager, the shift planning and manpower deployment for the shift/ line as per the proposed production plan
- PC11.** . support the process manager in creating week wise shift rosters for the shift/ line manpower and ensure rotation of manpower as per the organizational norms and guidelines
- PC12.** . maintain the information on leaves/ IN Out time keeping and shift/ line overtime for the operatives and helpers and share the information with the concerned as and when required
- PC13..** identify skilled manpower for the process and ensure periodic up - dation of Skill Matrix/ skill chart for the shift/ line/ process area
- PC14..** ensure identification and deployment of right skilled people at the right places on the line/ process area

Employee Performance Measurement and Employee Development

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

- PC15.** . ensure that all the operative manpower is aware of the production targets, production plan and daily productivity targets
- PC16.** . track the daily performance of the operators and helpers during the shift and note the achievement levels in a manual register/ online it enabled system
- PC17..** provide feedback to the operators and helper in case of any process deviation observed
- PC18..** provide feedback to managers pertaining to performance appraisals of operators and helpers
- PC19..** ensure that the operatives are trained and are aware of the processes which need to be followed on the shop floor during the production process
- PC20.** . support the manager and the training team in training of entry level operators and helpers in the plant
- PC21.** . share knowledge of processes , inputs and outputs with the operators to enhance their skill levels
- PC22.** . other than technical trainings, support the team by delivering trainings related to quality and safety for the operators and helpers
- PC23.** . drive a culture of creativity and innovation in the team by given the team members opportunity to think out of box and express their thoughts

Grievance Management for Operators and Helpers

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

- PC24.** . in case the operating staff has any queries, ensure that the queries are resolved either by self or escalated to the concerned person
- PC25.** . listen to issues related to workmen problems/ work men grievances/ complaints/ personal problems etc. for the operators and helpers
- PC26..** resolve issues which are under the purview of the supervisor and escalate the ones which need higher intervention to the concerned team

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** relevant HR Policies and Processes followed by the organization
- KU2.** different types of products manufactured by the company

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- KU3.** knowledge of functional processes like Procurement, Store management, inventory management, quality management and key contact points for query resolution
- KU4.** 5S and Safety norms practiced in the organization
- KU5.** different types of manufacturing processes
- KU6.** various grievance management tools available in the organization
- KU7.** various problems solving tools like 7QC, Why Why Analysis, Brain storming
- KU8.** different types of communication channels practiced by the organization
- KU9.** the method of noting observations, maintaining records and sharing them with the concerned in the required format
- KU10.** knowledge of shift roster norms and guidelines
- KU11.** how and when to measure performance of the operators
- KU12.** how to share feedback with team members

Generic Skills (GS)

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

- GS1.** document information from the manuals, discussion notes, process charts etc.
- GS2.** create small notes/ work documents/ diagrams for operators and helpers to help them understand the process
- GS3.** use emails and other business correspondence methods (internal memos, circular etc.) for communicating with other team members/ vendors/ suppliers etc
- GS4.** read internal information memos send by internal customers (other functions within the organization)
- GS5.** discuss task lists, schedules, and work-loads with the operative team members
- GS6.** answer the queries raised by the operative team as well as intercompany departments
- GS7.** effectively communicate with the operators and helpers and make them aware of work expectations, targets, policies, processes etc.
- GS8.** attentively listen with full attention the queries and grievances raised by the operative team and comprehend the information given by the speaker
- GS9.** identify the strengths and weaknesses of the subordinate team members (operators and helpers)
- GS10.** provide constructive and genuine feedback
- GS11.** motivate the team to take independently responsibilities in their work areas
- GS12.** provide training to the operators and helpers for technical and behavioural areas
- GS13.** communicate effectively to the team members
- GS14.** identify conflicts in the team and try to resolve them at the earliest
- GS15.** interact and engage with the team members on a day to day basis
- GS16.** counsel and coach the operators and help them resolve issues
- GS17.** timely highlight to the management about any good work/ achievement by the operators and helpers
- GS18.** display empathy for the problems faced by the team and act on the concerns
- GS19.** break the problem into smaller issues and tasks to arrive at a solution

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- GS20.** understand inter process relationship and establish relationship between various parts of the problem
- GS21.** leverage experience to find effective solutions to problems
- GS22.** use basic analytical tools to arrive at solutions
- GS23.** collaborate with cross functional teams to resolve problems
- GS24.** use common sense and make judgments during day to day basis
- GS25.** use reasoning skills to identify and resolve problems
- GS26.** use intuition to detect any potential problems which could arise during operations
- GS27.** critically analyse solutions/ recommendations shared by operatives and supervisors for implementation
- GS28.** accept additional responsibility for self and the team
- GS29.** encourage self and other to take greater responsibilities
- GS30.** ensure that the work allocated to the team is completed as per timelines and quality norms
- GS31.** identify obstacles and bottlenecks in the process and on own find basic level solutions for removing these obstacles
- GS32.** motivate and provide support for the team on the shop floor
- GS33.** encourage collaboration between team members
- GS34.** resolve team issues and grievances to manage conflicts within the team
- GS35.** create an environment of approachability, trust and openness within the team
- GS36.** ensure role clarity for all operators and helpers on the line/ shift
- GS37.** escalate any team related issues to the concerned person at the right time
- GS38.** use previous experience in resolving problems and taking decisions
- GS39.** 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>Engaging the shop floor work force through employee communication and employee engagement</i>	13	25	-	-
PC1. . ensure operators and helpers on the production line/ shift are aware of the job expectations on a daily basis	2	3	-	-
PC2. . ensure that the operators are aware of the production targets and the timelines required to process a work order as finalized in the production plan	2	3	-	-
PC3.. involve operators and helpers for the daily floor meeting/ morning meetings/ staff meetings to communicate information intended for them	1	2	-	-
PC4. . ensure communication to line operators/ helpers on any changes in policies/ processes by the organization through required verbal/ written mechanisms	1	3	-	-
PC5. . ensure participation of employees in various engagement initiatives organized at the plant and other place by the organization	1	2	-	-
PC6. . involve operators and helpers in Quality Circles, TQM & kaizen meets, brainstorming sessions, safety drills etc. to increase their involvement in manufacturing operations	2	3	-	-
PC7. . ensure availability of tea, snacks, drinking water and basic hygiene facilities at the shop floor for the operative workforce.	1	3	-	-
PC8.. escalate issues to concerned staff in case of any issue related to operative deployment and engagement	1	3	-	-
PC9. . ensure employees at the shop floor are motivated and their concerns are resolved	2	3	-	-
<i>Finalizing manpower deployment</i>	5	15	-	-

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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC10. . finalize along with the process manager, the shift planning and manpower deployment for the shift/ line as per the proposed production plan	1	3	-	-
PC11. . support the process manager in creating week wise shift rosters for the shift/ line manpower and ensure rotation of manpower as per the organizational norms and guidelines	1	3	-	-
PC12. . maintain the information on leaves/ IN Out time keeping and shift/ line overtime for the operatives and helpers and share the information with the concerned as and when required	1	3	-	-
PC13.. identify skilled manpower for the process and ensure periodic up - dation of Skill Matrix/ skill chart for the shift/ line/ process area	1	3	-	-
PC14.. ensure identification and deployment of right skilled people at the right places on the line/ process area	1	3	-	-
<i>Employee Performance Measurement and Employee Development</i>	9	23	-	-
PC15. . ensure that all the operative manpower is aware of the production targets, production plan and daily productivity targets	1	3	-	-
PC16. . track the daily performance of the operators and helpers during the shift and note the achievement levels in a manual register/ online it enabled system	1	3	-	-
PC17.. provide feedback to the operators and helper in case of any process deviation observed	1	3	-	-
PC18.. provide feedback to managers pertaining to performance appraisals of operators and helpers	1	3	-	-
PC19.. ensure that the operatives are trained and are aware of the processes which need to be followed on the shop floor during the production process	1	2	-	-
PC20. . support the manager and the training team in training of entry level operators and helpers in the plant	1	2	-	-

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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC21. . share knowledge of processes , inputs and outputs with the operators to enhance their skill levels	1	2	-	-
PC22. . other than technical trainings, support the team by delivering trainings related to quality and safety for the operators and helpers	1	2	-	-
PC23. . drive a culture of creativity and innovation in the team by given the team members opportunity to think out of box and express their thoughts	1	3	-	-
<i>Grievance Management for Operators and Helpers</i>	3	7	-	-
PC24. . in case the operating staff has any queries, ensure that the queries are resolved either by self or escalated to the concerned person	1	2	-	-
PC25. . listen to issues related to workmen problems/ work men grievances/ complaints/ personal problems etc. for the operators and helpers	1	3	-	-
PC26.. resolve issues which are under the purview of the supervisor and escalate the ones which need higher intervention to the concerned team	1	2	-	-
NOS Total	30	70	-	-

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National Occupational Standards (NOS) Parameters

NOS Code	ASC/N0018
NOS Name	Managing the team on the line/shift on a day to day basis
Sector	Automotive
Sub-Sector	Manufacturing
Occupation	Welding
NSQF Level	6
Credits	TBD
Version	1.0
Last Reviewed Date	28/12/2013
Next Review Date	28/12/2015
NSQC Clearance Date	

Qualification Pack

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

Description

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

Scope

The individual needs to

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

Elements and Performance Criteria

Ensure proper sorting of items at the work place

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

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

Ensure proper documentation and storage streamlining & organizing the workplace

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

- PC11.** ensure that the team follows the given instructions and checks for labelling of fluids, oils lubricants, solvents, chemicals etc and proper storage of the same to avoid spillage, leakage, fire etc

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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	-	-

Qualification Pack

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/N3906: Manage various heat treatment operations like carburizing, tempering, induction hardening, quenching and washing, set the furnace and train the team

Description

This NOS is about supervising end to end operations to ensure that the final products manufactured by heat treatment team is as per the quality and production norms set by the organization

Scope

The Heat Treatment Metallurgist or shift in charge will be responsible for managing end to end Heat Treatment operations in the shift setting the furnace and gas flow parameters and operating process training team members on the process The job holder will cover all types of heat treatment processes The role holder will interact with the machine shop, assembly line, maintenance team, HR, quality management and material management team

- managing end to end Heat Treatment operations in the shift
- setting the furnace and gas flow parameters and operating process
- training team members on the process

Elements and Performance Criteria

Manage Heat Treatment operations during the shift

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

- PC1.** . ensure that the furnace operators and quenching operators have fully understood the job/ task mentioned in the work order
- PC2.** . ensure that the team members understand and follow all the does and donts of the manufacturing process as defined in sops/ work instructions or defined by supervisors/ master technicians
- PC3.** . ensure that the pre heat treatment processes like pre washing etc. are performed as per the work instructions
- PC4.** . ensure that the endo gas required for the heat treatment process is available at the temperature and flow rate as mentioned in the work instructions/ control plan
- PC5.** . finalize the endo gas parameters like gas temperature, gas flow, cooling jacket temperature, carbon potential, flow ratio, gas pressure, opening and closing of valves etc.
- PC6.** . ensure proper monitoring of endo gas parameters like gas temperature, gas flow, cooling etc. and check for any deviations from the set parameter limits
- PC7.** . check for material availability in the stores for the heat treatment team as per the production plan shared for the shift
- PC8.** . based on the type of metal and the heat treatment process to be conducted, finalize operating parameters for the furnace like cycle time, charge loading time, furnace temperature, quenching time etc.
- PC9.** . ensure that the correct operating parameters are selected by the operator and that the operator and the helper are using the right technique as mentioned in the work instructions created by the metallurgist

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- PC10.** . ensure that the operator is maintaining the correct cycle time for the furnace and completion of the furnace operations as mentioned in the control plan/ work instructions/ sops
- PC11.** . ensure that the operator takes the correct readings on the panels to ensure an error free and risk free operation of furnaces, exchanges and auxiliaries like agitator motors, coolant pumps, oil circulation pumps etc.
- PC12.** . verify the product tagging used by the operator and ensure that the storage of produced goods is as per the sops/ work instructions and ensure that the measuring tools used by the operators are calibrated as per the internal guidelines/ sops
- PC13.** . ensure that the correct processes are followed by the operator for the quenching process (depending on the type of quenching process press quenching, plug quenching and free quenching
- PC14.**.. ensure that cleaning and maintenance of all related equipment is as per the schedule and checklist provided by the maintenance team
- PC15.** . ensure that the material and work piece movement on the shop floor conforms to the tat time prescribed in the sop/ work plans so that production targets are met for the line/ shift
- PC16.** . ensure that suitable precautions are taken by the team while operating furnaces, shot blasting machines, quenching machines, induction hardeners etc. like using the required personal protective equipment
- PC17.** . periodically conduct process audit to validate the correctness of the process followed by the operators and helpers
- PC18.** . conduct batch wise non destructive tests to ascertain the hardness, strength and microstructure of the treated component. certify every batch of quality worthiness
- PC19.**.. conduct inspection of the selected work pieces in the laboratory for validtions
- PC20.** . ensure hassle free and systematic material identification (pre & post heat treatment) and batch wise traceability to ensure minimum errors during finished goods management

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** relevant manufacturing standards and procedures followed in the company
- KU2.** different types of products manufactured by the company
- KU3.** functional processes like Procurement, Store management, inventory management, quality management and key contact points for query resolution
- KU4.** quality norms and standards prescribed in the Quality Manual by the organization for heat treatment
- KU5.** 5S and Safety norms practiced in the organization
- KU6.** different types of heat treatment processes and associated equipment
- KU7.** different types of furnaces and process nuances for each type of heat treatment process
- KU8.** basic knowledge of the metallurgical properties of the material
- KU9.** relationship between various process parameters like furnace temperature, pressure, carbon potential, gas flow for endothermic process, Cycle time for heating during the heat treatment process

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- KU10.** how to read displays on the computer monitor and understand the information being displayed
- KU11.** understand various alarms and signals in the furnace and the action required for each type of alarm
- KU12.** various standards required for the heat treatment process
- KU13.** basic knowledge of machining activities like Grinding, milling, shaping etc.
- KU14.** methods for lifting and loading/unloading the metal components in the furnace
- KU15.** methods to test hardness of metals and usage of hardness testing machines in laboratories
- KU16.** basic troubleshooting techniques for the furnaces
- KU17.** basic principles of geometric and drawing and tolerances
- KU18.** various mechanisms of material handling and shifting
- KU19.** various methods of inspection of finished goods
- KU20.** types of defects in treated components and impact of the defect on the overall equipment operations
- KU21.** various problems solving tools like 7QC, Why Why Analysis, Brain storming
- KU22.** potential health and safety hazards and related Safety precautions to be undertaken during the Heat Treatment process

Generic Skills (GS)

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

- GS1.** document information from the manuals, discussion notes, process charts etc.
- GS2.** create small notes/ work documents/ diagrams for operators and helpers to help them understand the process
- GS3.** write inter departmental notes/ memos or make suitable entries in the online system
- GS4.** read equipment manuals and process documents to understand the equipment and processes better
- GS5.** read internal information memos sent by internal customers (other functions within the organization)
- GS6.** discuss task lists, schedules, and work-loads with the operative team members
- GS7.** answer the queries raised by the operative team as well as intercompany departments
- GS8.** effectively communicate with the operators and helpers and make them aware of work expectations, targets, policies, processes etc.
- GS9.** attentively listen with full attention the queries and grievances raised by the operative team and comprehend the information given by the speaker
- GS10.** break the problem into smaller issues and tasks to arrive at a solution
- GS11.** understand inter process relationship and establish relationship between various parts of the problem
- GS12.** leverage experience to find effective solutions to problems
- GS13.** use basic analytical tools to arrive at solutions
- GS14.** plan, organize and prioritize the work order and jobs received from the production manager

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- GS15.** manage the schedule plan for the operators and helpers on the line/shift SB7. validate all process/ equipment manuals so that the final process selected is correct
- GS16.** organize information, tools, manuals etc. on the shop floor so that sorting becomes easy
- GS17.** reorganize resources on the line/ shift in case of change of plans
- GS18.** use common sense and make judgments during day to day basis
- GS19.** use reasoning skills to identify and resolve problems
- GS20.** use intuition to detect any potential problems which could arise during operations
- GS21.** accept additional responsibility for self and the team
- GS22.** encourage self and other to take greater responsibilities
- GS23.** ensure that the work allocated to the team is completed as per timelines and quality norms
- GS24.** identify obstacles and bottlenecks in the process and on own find basic level solutions for removing these obstacles
- GS25.** identify defective parts in the manufacturing line by comparing manufactured pieces with the work standard
- GS26.** link the defect observed with the overall impact on the performance of the component/ automobile
- GS27.** support and contribute in monitoring and delivering high quality output from self and others
- GS28.** train team members on maintaining quality standards set by the organization
- GS29.** use previous experience in resolving problems and taking decisions
- GS30.** make timely and independent decisions on the line/ shift within the boundaries of the delegation matrix of the organization
- GS31.** familiarise with leading practices available in the market
- GS32.** think independently on new approaches to manufacturing process, material management, data management and team management
- GS33.** represent any new ideas/ approaches on process improvement and productivity improvement to the seniors in the team

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Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Manage Heat Treatment operations during the shift</i>				
PC1. . ensure that the furnace operators and quenching operators have fully understood the job/ task mentioned in the work order	2	3	-	-
PC2. . ensure that the team members understand and follow all the does and donts of the manufacturing process as defined in sops/ work instructions or defined by supervisors/ master technicians	1	4	-	-
PC3. . ensure that the pre heat treatment processes like pre washing etc. are performed as per the work instructions	1	3	-	-
PC4. . ensure that the endo gas required for the heat treatment process is available at the temperature and flow rate as mentioned in the work instructions/ control plan	2	3	-	-
PC5. . finalize the endo gas parameters like gas temperature, gas flow, cooling jacket temperature, carbon potential, flow ratio, gas pressure, opening and closing of valves etc.	2	3	-	-
PC6. . ensure proper monitoring of endo gas parameters like gas temperature, gas flow, cooling etc. and check for any deviations from the set parameter limits	1	4	-	-
PC7. . check for material availability in the stores for the heat treatment team as per the production plan shared for the shift	1	4	-	-
PC8. . based on the type of metal and the heat treatment process to be conducted, finalize operating parameters for the furnace like cycle time, charge loading time, furnace temperature, quenching time etc.	2	4	-	-

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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC9. . ensure that the correct operating parameters are selected by the operator and that the operator and the helper are using the right technique as mentioned in the work instructions created by the metallurgist	2	3	-	-
PC10. . ensure that the operator is maintaining the correct cycle time for the furnace and completion of the furnace operations as mentioned in the control plan/ work instructions/ sops	1	4	-	-
PC11. . ensure that the operator takes the correct readings on the panels to ensure an error free and risk free operation of furnaces, exchanges and auxiliaries like agitator motors, coolant pumps, oil circulation pumps etc.	2	3	-	-
PC12. . verify the product tagging used by the operator and ensure that the storage of produced goods is as per the sops/ work instructions and ensure that the measuring tools used by the operators are calibrated as per the internal guidelines/ sops	1	4	-	-
PC13. . ensure that the correct processes are followed by the operator for the quenching process (depending on the type of quenching process press quenching, plug quenching and free quenching	1	4	-	-
PC14. ensure that cleaning and maintenance of all related equipment is as per the schedule and checklist provided by the maintenance team	1	4	-	-
PC15. . ensure that the material and work piece movement on the shop floor conforms to the tat time prescribed in the sop/ work plans so that production targets are met for the line/ shift	1	4	-	-
PC16. . ensure that suitable precautions are taken by the team while operating furnaces, shot blasting machines, quenching machines, induction hardeners etc. like using the required personal protective equipment	1	4	-	-
PC17. . periodically conduct process audit to validate the correctness of the process followed by the operators and helpers	1	4	-	-

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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC18. . conduct batch wise non destructive tests to ascertain the hardness, strength and microstructure of the treated component. certify every batch of quality worthiness	2	3	-	-
PC19.. conduct inspection of the selected work pieces in the laboratory for validtions	1	4	-	-
PC20. . ensure hassle free and systematic material identification (pre & post heat treatment) and batch wise traceability to ensure minimum errors during finished goods management	1	4	-	-
NOS Total	27	73	-	-

Qualification Pack

National Occupational Standards (NOS) Parameters

NOS Code	ASC/N3906
NOS Name	Manage various heat treatment operations like carburizing, tempering, induction hardening, quenching and washing, set the furnace and train the team
Sector	Automotive
Sub-Sector	Manufacturing
Occupation	Heat Treatment
NSQF Level	6
Credits	TBD
Version	1.0
Last Reviewed Date	25/12/2013
Next Review Date	25/12/2015
NSQC Clearance Date	

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 % aggregate for QP : 75

Assessment Weightage

Compulsory NOS

National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
ASC/N0006.Maintain a safe and healthy working environment	25	75	-	-	100	10
ASC/N0016.Understanding process requirements, ensuring process implementation & suggesting process improvement initiatives	30	70	-	-	100	15

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National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
ASC/N0017.Manage the production related operations of the shift/line on a day to day basis	30	70	-	-	100	20
ASC/N0018.Managing the team on the line/shift on a day to day basis	30	70	-	-	100	15
ASC/N0022.Ensure implementation of 5S activities at the shop floor & the office area	29	71	-	-	100	15
ASC/N3906.Manage various heat treatment operations like carburizing, tempering, induction hardening, quenching and washing, set the furnace and train the team	27	73	-	-	100	25
Total	171	429	-	-	600	100

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.