



Automotive Forging Technician

QP Code: ASC/Q4501

Version: 2.0

NSQF Level: 4

Automotive Skills Development Council || 153, Gr Floor, Okhla Industrial Area, Phase - III, Leela Building
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ASC/Q4501: Automotive Forging Technician

Brief Job Description

The individual is involved in operating the forging process apparatus and performing various forging and post-forging activities.

Personal Attributes

The person should be patient, organised, team-oriented and have the ability to work for long hours in adverse conditions. They should be keen observers and have an eye for detail and quality.

Applicable National Occupational Standards (NOS)

Compulsory NOS:

1. [ASC/N9803: Organize work and resources \(Manufacturing\)](#)
2. [ASC/N9802: Interact effectively with colleagues, customers and others](#)
3. [ASC/N4501: Prepare for forging operations](#)
4. [ASC/N4502: Perform forging operations](#)
5. [ASC/N4503: Perform post-forging operations](#)

Qualification Pack (QP) Parameters

Sector	Automotive
Sub-Sector	Manufacturing
Occupation	Forging Operation
Country	India
NSQF Level	4
Aligned to NCO/ISCO/ISIC Code	NCO-2015/7221.0301
Minimum Educational Qualification & Experience	10th Class + 1 year ITI with 4 years of experience OR 10th Class + 2 year ITI with 3 year of experience

	OR 12th Class with 3 Years of experience
Minimum Level of Education for Training in School	
Pre-Requisite License or Training	NA
Minimum Job Entry Age	18 Years
Last Reviewed On	29/07/2021
Next Review Date	29/07/2026
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Version	2.0

ASC/N9803: Organize work and resources (Manufacturing)

Description

This NOS unit is about implementing safety, planning work, adopting sustainable practices for optimising use of resources

Scope

The scope covers the following :

- Maintain safe and secure working environment
- Health and hygiene
- Perform work as per quality standards
- Effective waste management practices
- Material/energy conservation practices

Elements and Performance Criteria

Maintain safe and secure working environment

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

- PC1. identify hazardous activities and the possible causes of risks or accidents in the workplace
- PC2. follow safe working practices while dealing with hazards to ensure safety of self and others
- PC3. carry out routine check of the machine for identifying potential hazards
- PC4. use appropriate protective clothing/equipment for specific tasks and work
- PC5. follow safety hazards and preventive techniques during fire drill
- PC6. report any identified breaches in health, safety and security policies and procedures to the designated person

Health and hygiene

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

- PC7. ensure workstation and equipment are regularly clean and sanitized
- PC8. clean hands with soap, alcohol-based sanitizer regularly
- PC9. avoid contact with ill people and self-isolate in a similar situation
- PC10. wear and dispose PPEs regularly and appropriately
- PC11. report advanced hygiene and sanitation issues to appropriate authority
- PC12. follow stress and anxiety management techniques

Perform work as per quality standards

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

- PC13. ensure that work is accomplished as per the requirements within the specified timeline
- PC14. ensure team goals are given preference over individual goals

Effective waste management practices

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

- PC15. follow the fundamentals of 5S for waste management
- PC16. segregate waste into different categories

- PC17. follow processes specified for disposal of hazardous waste
- PC18. identify recyclable, non-recyclable and hazardous waste
- PC19. dispose non-recyclable, recyclable and reusable waste appropriately at identified location

Material/energy conservation practices

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

- PC20. identify ways to optimize usage of material in various tasks/activities/processes
- PC21. check for spills/leakages in various tasks/activities/processes
- PC22. plug spills/leakages and escalate to appropriate authority if unable to rectify
- PC23. check if the equipment/machine is functioning normally before commencing work and rectify wherever required
- PC24. report malfunctioning (fumes/ sparks/emission/vibration/noise) and lapse in maintenance of equipment
- PC25. ensure electrical equipment and appliances are properly connected and turned off when not in use

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1. organisation procedures for health, safety and security, individual role and responsibilities in this context
- KU2. the organisation's emergency procedures for different emergency situations and the importance of following the same
- KU3. evacuation procedures for workers and visitors
- KU4. how and when to report hazards as well as the limits of responsibility for dealing with hazards
- KU5. potential hazards, risks and threats based on the nature of work
- KU6. preventative and remedial actions to be taken in case of exposure to toxic material
- KU7. various types of fire extinguisher
- KU8. various types of safety signs and their meaning
- KU9. appropriate first aid treatment relevant to different condition e.g. bleeding, minor burns, eye injuries etc.
- KU10. relevant standards, procedures and policies related to 5S followed in the company
- KU11. the various materials used and their storage norms
- KU12. efficient utilisation of material and water
- KU13. basics of electricity and prevalent energy efficient devices
- KU14. common practices of conserving electricity
- KU15. common sources and ways to minimize pollution
- KU16. categorisation of waste into dry, wet, recyclable, non-recyclable and items of single-use plastics
- KU17. usage of different colors of dustbins
- KU18. waste management techniques
- KU19. significance of greening

Generic Skills (GS)

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

- GS1. read safety instructions/guidelines
- GS2. modify work practices to improve them
- GS3. ask for clarifications from superior about the job requirement
- GS4. work with supervisors/team members to carry out work related tasks
- GS5. complete tasks efficiently and accurately within stipulated time
- GS6. inform/report to concerned person in case of any problem
- GS7. make timely decisions for efficient utilization of resources
- GS8. write reports such as accident report, in at least English/regional language
- GS9. be punctual and utilize time efficiently

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Maintain safe and secure working environment</i>	11	5	-	7
PC1. identify hazardous activities and the possible causes of risks or accidents in the workplace	2	1	-	2
PC2. follow safe working practices while dealing with hazards to ensure safety of self and others	2	-	-	1
PC3. carry out routine check of the machine for identifying potential hazards	2	1	-	1
PC4. use appropriate protective clothing/equipment for specific tasks and work	2	1	-	1
PC5. follow safety hazards and preventive techniques during fire drill	2	1	-	1
PC6. report any identified breaches in health, safety and security policies and procedures to the designated person	1	1	-	1
<i>Health and hygiene</i>	7	5	-	2
PC7. ensure workstation and equipment are regularly clean and sanitized	2	2	-	1
PC8. clean hands with soap, alcohol-based sanitizer regularly	1	1	-	1
PC9. avoid contact with ill people and self-isolate in a similar situation	1	-	-	-
PC10. wear and dispose PPEs regularly and appropriately	1	-	-	-
PC11. report advanced hygiene and sanitation issues to appropriate authority	1	1	-	-
PC12. follow stress and anxiety management techniques	1	1	-	-
<i>Perform work as per quality standards</i>	5	3	-	2
PC13. ensure that work is accomplished as per the requirements within the specified timeline	2	2	-	1

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC14. ensure team goals are given preference over individual goals	3	1	-	1
<i>Effective waste management practices</i>	15	10	-	4
PC15. follow the fundamentals of 5S for waste management	3	2	-	1
PC16. segregate waste into different categories	2	1	-	-
PC17. follow processes specified for disposal of hazardous waste	2	2	-	1
PC18. identify recyclable, non-recyclable and hazardous waste	4	2	-	1
PC19. dispose non-recyclable, recyclable and reusable waste appropriately at identified location	4	3	-	1
<i>Material/energy conservation practices</i>	12	7	-	5
PC20. identify ways to optimize usage of material in various tasks/activities/processes	2	1	-	1
PC21. check for spills/leakages in various tasks/activities/processes	2	1	-	1
PC22. plug spills/leakages and escalate to appropriate authority if unable to rectify	2	1	-	-
PC23. check if the equipment/machine is functioning normally before commencing work and rectify wherever required	2	2	-	1
PC24. report malfunctioning (fumes/sparks/emission/vibration/noise) and lapse in maintenance of equipment	2	1	-	1
PC25. ensure electrical equipment and appliances are properly connected and turned off when not in use	2	1	-	1
NOS Total	50	30	-	20

National Occupational Standards (NOS) Parameters

NOS Code	ASC/N9803
NOS Name	Organize work and resources (Manufacturing)
Sector	Automotive
Sub-Sector	Generic
Occupation	Generic
NSQF Level	3
Credits	TBD
Version	1.0
Last Reviewed Date	29/07/2021
Next Review Date	29/07/2026
NSQC Clearance Date	29/07/2021

ASC/N9802: Interact effectively with colleagues, customers and others

Description

This NOS unit is about communicating with customers and colleagues/superiors, either in own work group or in other work groups within organisation.

Scope

The scope covers the following :

- Communicate effectively with colleagues, customers and others
- Interact with supervisor or superior

Elements and Performance Criteria

Communicate effectively with colleagues, customers and others

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

- PC1. maintain clear communication with colleagues, customers and others, wherever needed, through all means i.e. face-to-face, telephonic or written
- PC2. adjust communication styles to reflect gender and persons with disability (PwD) sensitivity
- PC3. work in a way that shows respect for colleagues and others
- PC4. follow the organisation's policies and procedures while working in a team
- PC5. respect personal space of colleagues and customers

Interact with supervisor or superior

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

- PC6. identify work requirements by receiving instructions from reporting supervisor
- PC7. escalate problems to supervisors that cannot be handled including repairs and maintenance of machine
- PC8. report the completed work
- PC9. rectify errors as per feedback

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1. the importance of effective communication and establishing good working relationships with colleagues and supervisor
- KU2. different methods of communication as per the circumstances
- KU3. gender based concepts, issues and legislation

Generic Skills (GS)

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

- GS1. read instructions/guidelines/procedures

- GS2. listen effectively and orally communicate information
- GS3. ask for clarification and advice from the concerned person
- GS4. maintain positive and effective relationships with colleagues and customers
- GS5. evaluate the possible solution(s) to the problem
- GS6. deliver consistent and reliable service to customers
- GS7. complete written work with attention to detail
- GS8. check that the work meets customer requirements

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Communicate effectively with colleagues, customers and others</i>	36	11	-	14
PC1. maintain clear communication with colleagues, customers and others, wherever needed, through all means i.e. face-to-face, telephonic or written	8	-	-	4
PC2. adjust communication styles to reflect gender and persons with disability (PwD) sensitivity	8	-	-	-
PC3. work in a way that shows respect for colleagues and others	7	4	-	3
PC4. follow the organisation's policies and procedures while working in a team	7	4	-	3
PC5. respect personal space of colleagues and customers	6	3	-	4
<i>Interact with supervisor or superior</i>	14	19	-	6
PC6. identify work requirements by receiving instructions from reporting supervisor	7	4	-	-
PC7. escalate problems to supervisors that cannot be handled including repairs and maintenance of machine	-	5	-	3
PC8. report the completed work	7	5	-	-
PC9. rectify errors as per feedback	-	5	-	3
NOS Total	50	30	-	20

National Occupational Standards (NOS) Parameters

NOS Code	ASC/N9802
NOS Name	Interact effectively with colleagues, customers and others
Sector	Automotive
Sub-Sector	Generic
Occupation	Generic
NSQF Level	3
Credits	TBD
Version	1.0
Last Reviewed Date	29/07/2021
Next Review Date	29/07/2026
NSQC Clearance Date	29/07/2021

ASC/N4501: Prepare for forging operations

Description

This NOS is about preparing for forging operations as per the given work order and the standards specified by the organization.

Scope

The scope covers the following :

- Identify work requirements
- Prepare for forging operations

Elements and Performance Criteria

Identify work requirements

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

- PC1. identify the work to be done by interpreting the engineering drawings/work order/SOPs and instructions from supervisor
- PC2. identify the tools, forging apparatus and input materials required for the job
- PC3. select and arrange the right material (like metal bars), tools, forging apparatus i.e. dies, stampings, lifting equipment and consumables as per the SOP and job requirements

Prepare for forging operations

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

- PC4. use appropriate Personal Protective Equipment (PPE) for safe working in forging shop
- PC5. check the input material, tools and forging apparatus for any defects and that they are as per the required quality standards
- PC6. ensure that dies and forging apparatus are cleaned properly and free from oil, grease and dust particles
- PC7. cut the billets/bars into smaller components by using a hacksaw and ensure that the size is as per the given Work Instructions
- PC8. set the forging machine and its parameters as per the job requirements and SOP
- PC9. select the appropriate die as per the required output and fit it into the machine

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1. relevant standards and procedures followed in the company
- KU2. basic process followed for forging of the pieces
- KU3. different types of forging processes like hot, cold and warm and their respective operating parameters
- KU4. Standard Operating Procedures (SOP) recommended by OEM for using tools and forging apparatus

- KU5. impact of various forging parameters like temperature of the furnace, cycle time for various temperature levels & time duration during the heating, pressing, cooling etc. on the quality of output
- KU6. metallurgical properties of the metals used for the forging process
- KU7. mechanical and heat laws applicable on forging
- KU8. how to collect and store consumables, tools etc. as per organisational procedures
- KU9. use of appropriate PPE, material handling equipment and tools for completing the tasks
- KU10. how to check defects in the forging apparatus and tools
- KU11. safety requirements during the forging work

Generic Skills (GS)

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

- GS1. read and interpret drawings, work instructions, equipment manuals and process documents
- GS2. communicate the process requirements to the supervisor and co-workers
- GS3. attentively listen and comprehend the information given by the supervisor/team members
- GS4. write work related information in English/regional language
- GS5. recognise a workplace problem and take suitable action
- GS6. analyse and apply the information gathered from observation, experience, reasoning or communication to act efficiently
- GS7. plan and organise work according to the work requirements
- GS8. complete the assigned tasks with minimum supervision
- GS9. report to the supervisor or deal with a colleague individually, depending on the type of concern

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Identify work requirements</i>	13	18	-	8
PC1. identify the work to be done by interpreting the engineering drawings/work order/SOPs and instructions from supervisor	2	3	-	2
PC2. identify the tools, forging apparatus and input materials required for the job	6	7	-	3
PC3. select and arrange the right material (like metal bars), tools, forging apparatus i.e. dies, stampings, lifting equipment and consumables as per the SOP and job requirements	5	8	-	3
<i>Prepare for forging operations</i>	17	32	-	12
PC4. use appropriate Personal Protective Equipment (PPE) for safe working in forging shop	2	3	-	2
PC5. check the input material, tools and forging apparatus for any defects and that they are as per the required quality standards	3	7	-	2
PC6. ensure that dies and forging apparatus are cleaned properly and free from oil, grease and dust particles	2	4	-	2
PC7. cut the billets/bars into smaller components by using a hacksaw and ensure that the size is as per the given Work Instructions	4	7	-	3
PC8. set the forging machine and its parameters as per the job requirements and SOP	4	7	-	2
PC9. select the appropriate die as per the required output and fit it into the machine	2	4	-	1
NOS Total	30	50	-	20

National Occupational Standards (NOS) Parameters

NOS Code	ASC/N4501
NOS Name	Prepare for forging operations
Sector	Automotive
Sub-Sector	Manufacturing
Occupation	Forging Operation
NSQF Level	4
Credits	TBD
Version	2.0
Last Reviewed Date	29/07/2021
Next Review Date	29/07/2026
NSQC Clearance Date	29/07/2021

ASC/N4502: Perform forging operations

Description

This NOS is about performing the forging operations to shape the heated metal bars and perform finishing of the same in line with the required specifications and industry standards

Scope

The scope covers the following :

- Perform heating of metal bars
- Perform forging process
- Perform finishing activities

Elements and Performance Criteria

Perform heating of metal bars

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

- PC1. set the parameters of induction heaters/ furnace at a desired temperature range for preheating, heating as well as post heating zones
- PC2. load the billets in the furnace by using manual techniques or hoists, cranes, magnetic lifters etc.
- PC3. ensure that each thermal/ heating zone reaches the desired temperature levels when the billets are passing through the furnace
- PC4. observe the uniform heating of metal as per the desired specifications
- PC5. lift the hot metal from the furnace and load it into a compressing machine by using hoists, cranes, magnetic lifters ensure that
- PC6. start the compression machine and perform the compression process to reduce the diameter and increase the length of the hot billet as per the process requirements of forging stage
- PC7. inspect the output from compressing machine for required quality standards and measure the workpiece for geometry, material & dimensional parameters
- PC8. remove the bad quality billets from the main production line and allow the accepted billets to cool down for forging process

Perform forging process

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

- PC9. select the right program in the forging machine and make changes/modifications in the program as per the work instructions and production requirements
- PC10. feed the heated metal bars into forging presses with the help of magnetic robots
- PC11. adjust temperature of the die to ensure uniform heating of the workpiece
- PC12. adjust various parameters of main press machine including blocker, finisher and trimmer (like pressure, cycle time, etc.) as per the output requirement
- PC13. monitor the process parameters by reading the various gauges and correct them if not within standards
- PC14. monitor the forging operations and record the operational data as per the frequency in the control plan

PC15. ensure that the dies are being sprayed with coolants after every operation

PC16. remove the forged workpiece from machine and allow it to cool for sometime

Perform finishing activities

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

PC17. perform finishing operations such as twisting, straightening etc. on workpiece to get the desired specifications

PC18. measure the first workpiece for geometry, material & dimensional parameters and compare it with the specifications prescribed in the work order and engineering drawing

PC19. adjust the parameters of the corresponding presses for the finishing operations i.e. twisting, straightening etc. if required to get the desired specifications

PC20. run the machine for mass production of workpieces, when first-piece meets the specified requirements

PC21. report any emergencies/deviations from the Work Instructions/ Control Panel/SOP to the supervisor immediately

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. relevant standards and procedures followed in the company

KU2. basic process followed for forging of the pieces

KU3. how to use measurement instruments like rulers, Vernier calipers, micrometer, weighing scale, gauges and other inspection equipment

KU4. different types of forging processes like hot, cold and warm and their respective operating parameters

KU5. metallurgical properties of the material used

KU6. dimensions pertinent to pressing operations like diameter and length of the metal bars

KU7. different types of dies to be used for forging operations and their setting up mechanism

KU8. different parameters pertinent to pressing process like cycle time, force applied, gear and pinion movements, friction, torque etc.

KU9. Standard Operating Procedures (SOP) recommended by OEM for using magnetic robots, compressing machine, presses and dies

KU10. safety requirements during the forging work

KU11. how to read dials/indicators of forging machine to ensure machine is working properly

KU12. temperature ranges used for various metals and their impact on the properties of output

Generic Skills (GS)

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

GS1. read and interpret drawings, work instructions, equipment manuals and process documents

GS2. communicate the process requirements to the supervisor and co-workers

GS3. attentively listen and comprehend the information given by the supervisor/team members

GS4. write work related information in English/regional language

GS5. recognise a workplace problem and take suitable action

- GS6. analyse and apply the information gathered from observation, experience, reasoning or communication to act efficiently
- GS7. plan and organise work according to the work requirements
- GS8. complete the assigned tasks with minimum supervision
- GS9. report to the supervisor or deal with a colleague individually, depending on the type of concern

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Perform heating of metal bars</i>	11	17	-	10
PC1. set the parameters of induction heaters/ furnace at a desired temperature range for preheating, heating as well as post heating zones	2	2	-	2
PC2. load the billets in the furnace by using manual techniques or hoists, cranes, magnetic lifters etc.	1	2	-	1
PC3. ensure that each thermal/ heating zone reaches the desired temperature levels when the billets are passing through the furnace	2	2	-	2
PC4. observe the uniform heating of metal as per the desired specifications	2	2	-	1
PC5. lift the hot metal from the furnace and load it into a compressing machine by using hoists, cranes, magnetic lifters ensure that	1	2	-	-
PC6. start the compression machine and perform the compression process to reduce the diameter and increase the length of the hot billet as per the process requirements of forging stage	2	4	-	2
PC7. inspect the output from compressing machine for required quality standards and measure the workpiece for geometry, material & dimensional parameters	1	2	-	2
PC8. remove the bad quality billets from the main production line and allow the accepted billets to cool down for forging process	-	1	-	-
<i>Perform forging process</i>	12	20	-	7
PC9. select the right program in the forging machine and make changes/modifications in the program as per the work instructions and production requirements	2	4	-	2
PC10. feed the heated metal bars into forging presses with the help of magnetic robots	1	2	-	1
PC11. adjust temperature of the die to ensure uniform heating of the workpiece	1	2	-	1

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC12. adjust various parameters of main press machine including blocker, finisher and trimmer (like pressure, cycle time, etc.) as per the output requirement	3	4	-	1
PC13. monitor the process parameters by reading the various gauges and correct them if not within standards	1	2	-	-
PC14. monitor the forging operations and record the operational data as per the frequency in the control plan	2	3	-	1
PC15. ensure that the dies are being sprayed with coolants after every operation	1	1	-	1
PC16. remove the forged workpiece from machine and allow it to cool for sometime	1	2	-	-
<i>Perform finishing activities</i>	7	13	-	3
PC17. perform finishing operations such as twisting, straightening etc. on workpiece to get the desired specifications	2	4	-	1
PC18. measure the first workpiece for geometry, material & dimensional parameters and compare it with the specifications prescribed in the work order and engineering drawing	2	3	-	1
PC19. adjust the parameters of the corresponding presses for the finishing operations i.e. twisting, straightening etc. if required to get the desired specifications	1	2	-	1
PC20. run the machine for mass production of workpieces, when first-piece meets the specified requirements	1	2	-	-
PC21. report any emergencies/deviations from the Work Instructions/ Control Panel/SOP to the supervisor immediately	1	2	-	-
NOS Total	30	50	-	20

National Occupational Standards (NOS) Parameters

NOS Code	ASC/N4502
NOS Name	Perform forging operations
Sector	Automotive
Sub-Sector	Manufacturing
Occupation	Forging Operation
NSQF Level	4
Credits	TBD
Version	2.0
Last Reviewed Date	29/07/2021
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NSQC Clearance Date	29/07/2021

ASC/N4503: Perform post-forging operations

Description

This NOS unit is about conducting inspection of forged pieces and post-inspection activities such as repairing, segregation of correct pieces, cleaning etc.

Scope

The scope covers the following :

- Perform shot blasting process
- Perform quality check and inspection of workpieces
- Perform post-inspection activities
- Perform batch quality approval procedure

Elements and Performance Criteria

Perform shot blasting process

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

- PC1. clean the shot blasting machine by using air pressure blast to remove any dust particles and unwanted material
- PC2. check the shot blasting machine and its components for defects before use
- PC3. load the work pieces and shots on shot blasting machine and place the same securely on the designated slot/space as indicated in the WI
- PC4. start the machine and remove the surface imperfections from both sides of the workpiece as per the WI
- PC5. ensure that machine is in the moving position till the cycle time for both sides cycle is achieved as per the WI/ SOP
- PC6. remove the workpieces carefully from the machine and load them into the designated trolley

Perform quality check and inspection of workpieces

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

- PC7. check the work pieces as per the work instructions for product quality
- PC8. conduct destructive and non-destructive tests on the work pieces
- PC9. perform eddy current testing as per the WI to identify the flaws in workpiece
- PC10. perform magnetic particle inspection process as per the WI to identify the surface discontinuities in workpiece
- PC11. adjust the parameters of the apparatus (MPI Machine/other machinery) like current to be passed, power cycles, time duration, intensity of magnetic flux etc. as per the requirement of magnetic particle inspection process
- PC12. ensure that the parts are first magnetized and then demagnetized as per the magnetic cycles set for the machine in magnetic particle inspection process
- PC13. compare the texture, color, surface properties, hardness and strength with the given product specifications
- PC14. note down the observations of the basic inspection process and identify pieces which are as per the specified standards

Perform post-inspection activities

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

- PC15. rectify minor defects like shape deformation, sharp edges, rough surfaces, extra material from grooves, holes, parting line area etc. from the workpieces
- PC16. segregate the completed pieces in to Ok pieces, defective pieces which can be repaired/reworked and pieces which are beyond repair and maintain records of each category
- PC17. tag and store the right quality pieces by following organisational policies and procedures
- PC18. check the machine operations for any malfunctions/ defects in the component and inform the supervisor/maintenance team for correction
- PC19. clean the tools, forging apparatus and shot blasting machine after completion of all activities
- PC20. dispose scrap or waste material into the disposal area in accordance with the company's policies and environmental regulations

Perform batch quality approval procedure

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

- PC21. provide first and last work piece from each batch to the lab for quality check on its composition, soundness, metallography/grain structure, etc.
- PC22. obtain batch clearance from the lab

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1. relevant standards and procedures followed in the company
- KU2. basic process followed for inspection of the pieces
- KU3. how to use measurement instruments like rulers, Vernier calipers, micrometer, weighing scale, gauges and other inspection equipment
- KU4. shot blasting process
- KU5. various type of defects in forged products
- KU6. how to check defects in the completed workpiece
- KU7. post-casting processes like inspection, cleaning, maintenance etc.
- KU8. methods for repairing pieces with minor defects
- KU9. methods of storage and tagging of final product
- KU10. about the various testing techniques like visual, destructive and non-destructive
- KU11. parameters pertinent to eddy current process like amplitude, phase of the current and intensity of magnetic flux generated
- KU12. eddy current testing technique and materials to be used for measurement
- KU13. Standard Operating Procedures (SOP) recommended by OEM for using shot blasting, MPI, Eddy Current Testing etc. apparatus
- KU14. how to collect and store consumables, tools etc. as per organisational procedures

Generic Skills (GS)

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

- GS1. read and interpret drawings, work instructions, equipment manuals and process documents
- GS2. communicate the process requirements to the supervisor and co-workers
- GS3. attentively listen and comprehend the information given by the supervisor/team members
- GS4. write work related information in English/regional language
- GS5. recognise a workplace problem and take suitable action
- GS6. analyse and apply the information gathered from observation, experience, reasoning or communication to act efficiently
- GS7. plan and organise work according to the work requirements
- GS8. complete the assigned tasks with minimum supervision
- GS9. report to the supervisor or deal with a colleague individually, depending on the type of concern

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Perform shot blasting process</i>	7	13	-	5
PC1. clean the shot blasting machine by using air pressure blast to remove any dust particles and unwanted material	1	1	-	1
PC2. check the shot blasting machine and its components for defects before use	1	2	-	1
PC3. load the work pieces and shots on shot blasting machine and place the same securely on the designated slot/space as indicated in the WI	1	2	-	-
PC4. start the machine and remove the surface imperfections from both sides of the workpiece as per the WI	2	5	-	2
PC5. ensure that machine is in the moving position till the cycle time for both sides cycle is achieved as per the WI/ SOP	1	1	-	1
PC6. remove the workpieces carefully from the machine and load them into the designated trolley	1	2	-	-
<i>Perform quality check and inspection of workpieces</i>	14	20	-	9
PC7. check the work pieces as per the work instructions for product quality	2	2	-	1
PC8. conduct destructive and non-destructive tests on the work pieces	3	5	-	2
PC9. perform eddy current testing as per the WI to identify the flaws in workpiece	2	3	-	1
PC10. perform magnetic particle inspection process as per the WI to identify the surface discontinuities in workpiece	2	3	-	1
PC11. adjust the parameters of the apparatus (MPI Machine/other machinery) like current to be passed, power cycles, time duration, intensity of magnetic flux etc. as per the requirement of magnetic particle inspection process	1	2	-	1

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC12. ensure that the parts are first magnetized and then demagnetized as per the magnetic cycles set for the machine in magnetic particle inspection process	1	1	-	1
PC13. compare the texture, color, surface properties, hardness and strength with the given product specifications	2	2	-	1
PC14. note down the observations of the basic inspection process and identify pieces which are as per the specified standards	1	2	-	1
<i>Perform post-inspection activities</i>	7	14	-	5
PC15. rectify minor defects like shape deformation, sharp edges, rough surfaces, extra material from grooves, holes, parting line area etc. from the workpieces	2	4	-	1
PC16. segregate the completed pieces in to Ok pieces, defective pieces which can be repaired/reworked and pieces which are beyond repair and maintain records of each category	1	2	-	1
PC17. tag and store the right quality pieces by following organisational policies and procedures	1	2	-	1
PC18. check the machine operations for any malfunctions/ defects in the component and inform the supervisor/maintenance team for correction	1	2	-	1
PC19. clean the tools, forging apparatus and shot blasting machine after completion of all activities	1	2	-	1
PC20. dispose scrap or waste material into the disposal area in accordance with the company's policies and environmental regulations	1	2	-	-
<i>Perform batch quality approval procedure</i>	2	3	-	1
PC21. provide first and last work piece from each batch to the lab for quality check on its composition, soundness, metallography/grain structure, etc.	1	2	-	1
PC22. obtain batch clearance from the lab	1	1	-	-
NOS Total	30	50	-	20

National Occupational Standards (NOS) Parameters

NOS Code	ASC/N4503
NOS Name	Perform post-forging operations
Sector	Automotive
Sub-Sector	Manufacturing
Occupation	Forging Operation
NSQF Level	4
Credits	TBD
Version	2.0
Last Reviewed Date	29/07/2021
Next Review Date	29/07/2026
NSQC Clearance Date	29/07/2021

Assessment Guidelines and Assessment Weightage

Assessment Guidelines

1. Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Performance Criteria (PC) will be assigned marks proportional to its importance in NOS. SSC will also lay down the proportion of marks for Theory and Skills Practical for each PC.
2. The assessment for the theory part will be based on the 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 the 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. In case of unsuccessful completion, the trainee may seek reassessment on the Qualification Pack.

Minimum Aggregate Passing % at QP Level : 70

(Please note: Every Trainee should score a minimum aggregate passing percentage as specified above, to successfully clear the Qualification Pack assessment.)

Assessment Weightage

Compulsory NOS

National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
ASC/N9803.Organize work and resources (Manufacturing)	50	30	-	20	100	15
ASC/N9802.Interact effectively with colleagues, customers and others	50	30	-	20	100	10
ASC/N4501.Prepare for forging operations	30	50	-	20	100	25
ASC/N4502.Perform forging operations	30	50	-	20	100	25
ASC/N4503.Perform post-forging operations	30	50	-	20	100	25
Total	190	210	-	100	500	100

Acronyms

NOS	National Occupational Standard(s)
NSQF	National Skills Qualifications Framework
QP	Qualifications Pack
TVET	Technical and Vocational Education and Training
PPE	Personal Protective Equipment
PwD	Person with Disability
SOP	Standard Operating Practices
PwD	Persons with Disability

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.
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.