

QUALIFICATIONS PACK - OCCUPATIONAL STANDARDS FOR AUTOMOTIVE INDUSTRY

What are Occupational Standards (OS)?

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



Contents

1. Introduction and Contacts.....P.1
2. Qualifications Pack.....P.2
3. Glossary of Key TermsP.4
4. NOS Units.....P.6
5. Assessment Criteria.....P.53

Introduction

Qualifications Pack-Casting Technician- Sand Moulding

SECTOR: AUTOMOTIVE

SUB-SECTOR: MANUFACTURING

OCCUPATION: CASTING

JOB ROLE: CASTING TECHNICIAN – SAND MOULDING

REFERENCE ID: ASC/Q3205

ALIGNED TO: NCO-2004/7211.20

Sand Casting Technician: This role is similar for all types of sand related casting processes and can be performed both manually and through automated processes.

Brief Job Description: This role primarily involves managing the specifications of the sand and molten metal, setting up and operating the casting equipment and forming & finishing the final output

Personal Attributes:

Reading, writing and communication skills, ability to plan and prioritize, quality consciousness, safety orientation, Physique to sustain strenuous conditions, Dexterity, Ability to use fingers, hands and feet with ease to complete the assigned task (Dexterity), high precision and sensitivity to problem solving and sensitivity towards safety for self and equipment.

Contact Us:

ASDC, 1/6
Siri Institutional Area,
KhelGaon Road,
New Delhi-110049 (India)

E-mail:
skc@asdc.org.in



Job Details	Qualifications Pack Code	ASC/Q3205		
	Job Role	Casting Technician – sand Moulding		
	Credits(NSQF)	TBD	Version number	1.0
	Industry	Automotive	Drafted on	1/10/2013
	Sub-sector	Manufacturing	Last reviewed on	20/10/2013
	Occupation	Sand Casting	Next review date	Under revision expected date of revised version 31-dec -15
	NSQC Clearance on	20/07/15		

Job Role	Casting Technician – Sand Moulding
Role Description	Responsible for carrying out various types of pre & post sand casting operations & process documentation
NSQF level	4
Minimum Educational Qualifications	ITI
Maximum Educational Qualifications	Class 12th
Training (Suggested but not mandatory)	<ul style="list-style-type: none"> • Latest Sand Mould preparation technology and sand casting techniques & methodologies • Reading and writing skills • Safety and 5S • Quality Management
Minimum Job Entry Age	<p>1 ASDC recommends that candidates should seek full employment not before attaining an age of 18 years.</p> <p>2 However, as per Factories Act 1948 :</p> <ul style="list-style-type: none"> - No one can be employed before attaining the age of 15 - A person between the age of 15 – 18 (both inclusive) could be employed only With employers who follow safety and security systems & processes and also that the employee in this bracket will be working under supervision. <p>3 Please note that under the Factories Act 1948, different States may have slightly varying provision which need to be adhered to.</p>
Experience	2-3 years of experience in Sand Casting

<p>National Occupational Standards (NOS)</p>	<ol style="list-style-type: none"> 1. ASC/N3214: Understand and interpret engineering drawings and sketches related to casting 2. ASC/N3215: Understand Casting and sand moulding processes and equipment requirement to complete the task 3. ASC/N3216: Prepare the machine (apparatus) and auxiliaries 4. ASC/N3217: Perform the sand making related operations and monitor process parameters 5. ASC/N3218: Perform the core making related operations and monitor process parameters 6. ASC/N3219: Perform the mould making related operations and monitor process parameters 7. ASC/N3220: Perform the sand casting related operations and monitor process parameters 8. ASC/ N3221: Conduct quality checks and inspection of the finished sand cast products 9. ASC/N 0021: Maintain 5S at the work premises 10. ASC/N 0006: Maintain a safe and healthy working environment <p>Optional: N.A.</p>
<p>Performance Criteria</p>	<p>As described in the relevant NOS units</p>

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

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

Acronyms

ASC/N3214

Understand and interpret engineering drawings and sketches related to casting

National Occupational Standard



Overview

This unit is about understanding the product design and work order requirements by analyzing the available engineering drawings and sketches.

ASC/N3214

Understand and interpret engineering drawings and sketches related to casting

National Occupational Standard

Unit Code	ASC / N3214
Unit Title (Task)	Understand and interpret engineering drawings and sketches related to casting
Description	This NOS unit is about analysing the work/ job requirements by interpreting the drawings and sketches provided by the supervisor, understanding measurement dimensions and applying the knowledge to determine the mould and core specifications and the process which needs to be followed to create the output as per the specifications mentioned in the work order
Scope	The operator will be responsible for <ul style="list-style-type: none"> • Identification and understanding the drawings • Documentation of the drawings • escalations of any queries regarding the job The job holder will cover all types casting methods. The role holder will interact with the maintenance team and material management team
Performance Criteria(PC) w.r.t. the Scope	
Element	Performance Criteria
Identify the right drawing to be used for the process	PC1. Check the version of the engineering drawing provided. PC2. Select the latest version of the available engineering drawing so that the final measurements and design is available with the team
Understand the engineering drawings, sketches and work order and identify required work steps	PC3. Thoroughly understand the work order (work output) required from the process PC4. Clearly understanding the does and don'ts of the manufacturing process as defined in SOPs/ Work Instructions or defined by supervisors PC5. Refer all engineering drawings and sketches related to the work output to understand the measurement dimensions and shape of the required work output PC6. Identify the required activities which need to be executed in order achieve the final output as per the work order PC7. Ensure that the process adopted is according to the Work Instructions/ Standard Operating Procedures adopted
Documentation and storage of the drawings/ sketches	PC8. Store the drawings in a proper place where they cannot be damaged by moisture, chemicals, fire and can be easily accessed by the user PC9. Observe any modification, changes required in the drawing and communicate the same to the concerned team in the organization
Knowledge and Understanding (K)	
A. Organizational Context (Knowledge of the company / organization and	The user/individual on the job needs to know and understand: <ul style="list-style-type: none"> KA1. relevant standards and procedures followed in the company KA2. different types of products manufactured by the company KA3. functional processes like Procurement, Store management, inventory management, quality management and key contact points for query resolution

ASC/N3214

Understand and interpret engineering drawings and sketches related to casting

its processes)	
B. Technical Knowledge	<p>The user/individual on the job needs to know and understand:</p> <p>KB1. sketches and engineering drawings and how to interpret meaningful information from the drawings</p> <p>KB2. dimensions and characteristics of the final product output</p> <p>KB3. different types of sand making, core making and mould making processes and associated equipment</p> <p>KB4. different types of tools and machinery for casting and trim the output</p> <p>KB5. sketches and engineering drawings</p> <p>KB6. basic principles of geometric and drawing</p> <p>KB7. final product visualization from the drawing</p> <p>KB8. impact of various physical parameters like temperature, etc on the properties of final output product like strength, shape etc</p>
Skills (S) [Optional]	
A. Core Skills/ Generic Skills	Writing Skills
	<p>The user/ individual on the job needs to know and understand how to:</p> <p>SA1. document information from the sketches and engineering drawings</p> <p>SA2. prepare draft drawings for the final output product</p> <p>SA3. write drawings to internal customers on the requirement of apparatus, hand toolsetc</p>
	Reading Skills
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SA4. read and interpret engineering drawing and sketches</p> <p>SA5. read equipment manuals and process documents to understand the equipment and processes better</p> <p>SA6. read internal information drawings send by internal customers (other functions within the organization)</p>
	Oral Communication (Listening and Speaking skills)
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SA7. discuss task lists, schedules, and work-loads with co-workers</p> <p>SA8. question internal customers/ casting shop supervisor appropriately in order to understand the nature of the problem and make a diagnosis</p> <p>SA9. avoid using jargon, slang or acronyms when communicating with a customer, unless it is required</p>
B. Professional Skills	Plan and Organize
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB1. plan and organize the work order and jobs received from the internal customers</p> <p>SB2. plan and organize the design documents received from internal customers</p> <p>SB3. organize all process/ equipment manuals so that sorting out information is fast</p>

ASC/N3214

Understand and interpret engineering drawings and sketches related to casting

	Judgment and Critical Thinking
	The user/individual on the job needs to know and understand how to: SB4. use common sense and make judgments during day to day basis SB5. use reasoning skills to identify and resolve basic problems SB6. use intuition to detect any potential problems which could arise during operations
	Desire to learn and take initiatives
	The user/individual on the job needs to know and understand how to: SB7. follow instructions and work on areas of improvement identified SB8. complete the assigned tasks with minimum supervision SB9. complete the job defined by the supervisor within the timelines and quality norms
	Problem Solving and Decision making
The user/individual on the job needs to know and understand how to: SB10. detect problems in day to day tasks SB11. support supervisor in using specific problem solving techniques and detailing out the problems SB12. discuss possible solution with the supervisor for problem solving SB13. make decisions in emergency conditions in case the supervisor is not available(as per the authority matrix defined by the organization)	

ASC/N3214

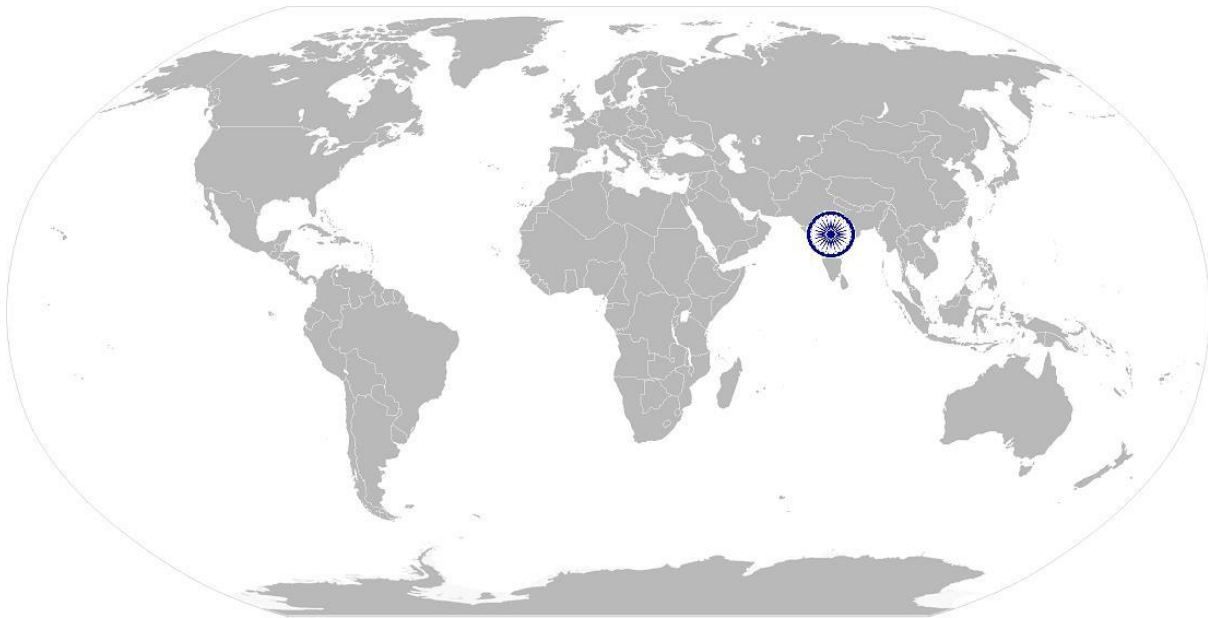
Understand and interpret engineering drawings and sketches related to casting

NOS Version Control

NOS Code	ASC/N3214		
Credits(NSQF)	TBD	Version number	1.0
Industry	Automotive	Drafted on	1/10/2013
Industry Sub-sector	Manufacturing	Last reviewed on	20/10/2013
Occupation	Sand Casting	Next review date	Under revision expected date of revised version 31-dec -15

ASC/N3215:Understand Casting and sand moulding processes and equipment requirement to complete the task

National Occupational Standard



Overview

This unit is about understanding the job requirement and hence understand the activities & equipment associated with the process to complete the task.

ASC/N3215:Understand Casting and sand moulding processes and equipment requirement to complete the task

Unit Code	ASC / N3215
Unit Title (Task)	Understand Casting and sand moulding processes and equipment requirement to complete the task
Description	This NOS unit is about understanding the job requirement, what processes need to be executed, what equipment will be used for the project and what is the required output considering the standards specified
Scope	The operator will be responsible for <ul style="list-style-type: none"> determining the type of sand, core and mould determine casting requirements and equipment escalations of any queries regarding the job The job holder will cover all types casting methods . The role holder will interact with the maintenance team and material management team
Performance Criteria(PC) w.r.t. the Scope	
Element	Performance Criteria
Determine the type of sand, core and mould requirement	PC1. Understand the specifications and dimensions of output and determine the type of sand to be used to prepare core and mould PC2. Understand the specifications and dimensions of output and determine the dimensions of core and mould
Determine the sand casting requirements, equipment and parameters	PC3. Determine the Casting methodology and process to be adopted for completing the work order PC4. Determine the various casting parameters like temperature, pouring speed etc. before starting the process PC5. Determine the equipment availability for executing the activity
Escalations of queries on the given job	PC6. Refer the queries to a competent internal specialist if they cannot be resolved by the operator on own PC7. Obtain help or advice from specialist if the problem is outside his/her area of competence or experience PC8. Confirm self understanding to the specialist once the query is resolved so that all doubts & queries can be resolved before the actual process execution
Knowledge and Understanding (K)	
B. Organizational Context (Knowledge of the company / organization and its processes)	The user/individual on the job needs to know and understand: <ul style="list-style-type: none"> KA1. relevant standards and procedures followed in the company KA2. different types of products manufactured by the company KA3. functional processes like Procurement, Store management, inventory management, quality management and key contact points for query resolution

ASC/N3215: Understand Casting and sand moulding processes and equipment requirement to complete the task

B. Technical Knowledge	<p>The user/individual on the job needs to know and understand:</p> <p>KB1. different specifications of sand to be used for preparing cores and moulds</p> <p>KB2. different types of core making and mould making methodologies</p> <p>KB3. different types of sand casting processes and associated equipments</p> <p>KB4. different types of tools and machinery to prepare and trim the output</p> <p>KB5. different types of automated processes pertinent to sand making, core making, mould making or casting</p> <p>KB6. different types of metallurgical processes</p> <p>KB7. sketches and engineering drawings</p> <p>KB8. final product output and hence decide on the key steps to be followed for preparing output and trimming</p> <p>KB9. impact of various physical parameters like temperature, etc on the properties of final output product like strength, shape etc</p> <p>KB10. basic principles of geometric and drawing</p> <p>KB11. hazards and safety aspects involved in handling molten metal</p>
Skills (S) [Optional]	
B. Core Skills/ Generic Skills	Writing Skills
	<p>The user/ individual on the job needs to know and understand how to:</p> <p>SA1. document information from the sketches and engineering drawings</p> <p>SA2. prepare draft drawings for the final output product</p> <p>SA3. write information documents to internal departments/ internal teams or enter the information in online ERP systems under guidance of the supervisor</p>
	Reading Skills
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SA4. read and interpret engineering drawing and sketches</p> <p>SA5. read equipment manuals and process documents to understand the equipment and processes better</p> <p>SA6. read internal information drawings send by internal customers (other functions within the organization)</p>
	Oral Communication (Listening and Speaking skills)
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SA7. discuss task lists, schedules, and work-loads with co-workers</p> <p>SA8. effectively communicate with the team members</p> <p>SA9. question internal customers/ shop supervisor appropriately in order to understand the nature of the problem and make a diagnosis</p> <p>SA10. avoid using jargon, slang or acronyms when communicating with a customer, unless it is required</p>
B. Professional Skills	Plan and Organize
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB1. plan and organize the work order and jobs received from the Operator</p> <p>SB2. organize all process/ equipment manuals so that sorting/ accessing information is easy</p> <p>SB3. support the supervisor in scheduling tasks for helper and assistant supervisor</p>

ASC/N3215:Understand Casting and sand moulding processes and equipment requirement to complete the task

	Judgment and Critical Thinking
	The user/individual on the job needs to know and understand how to: SB4. use common sense and make judgments during day to day basis SB5. use reasoning skills to identify and resolve basic problems SB6. use intuition to detect any potential problems which could arise during operations
	Desire to learn and take initiatives
	The user/individual on the job needs to know and understand how to: SB7. follow instructions and work on areas of improvement identified SB8. complete the assigned tasks with minimum supervision SB9. complete the job defined by the supervisor within timelines and quality norms
	Problem Solving and Decision making
	The user/individual on the job needs to know and understand how to: SB10. detect problems in day to day tasks SB11. support supervisor in using specific problem solving techniques and detailing out the problems SB12. discuss possible solution with the supervisor for problem solving SB13. make decisions in emergency conditions in case the supervisor is not available(as per the authority matrix defined by the organization)



ASC/N3215:Understand Casting and sand moulding processes and equipment requirement to complete the task

NOS Version Control

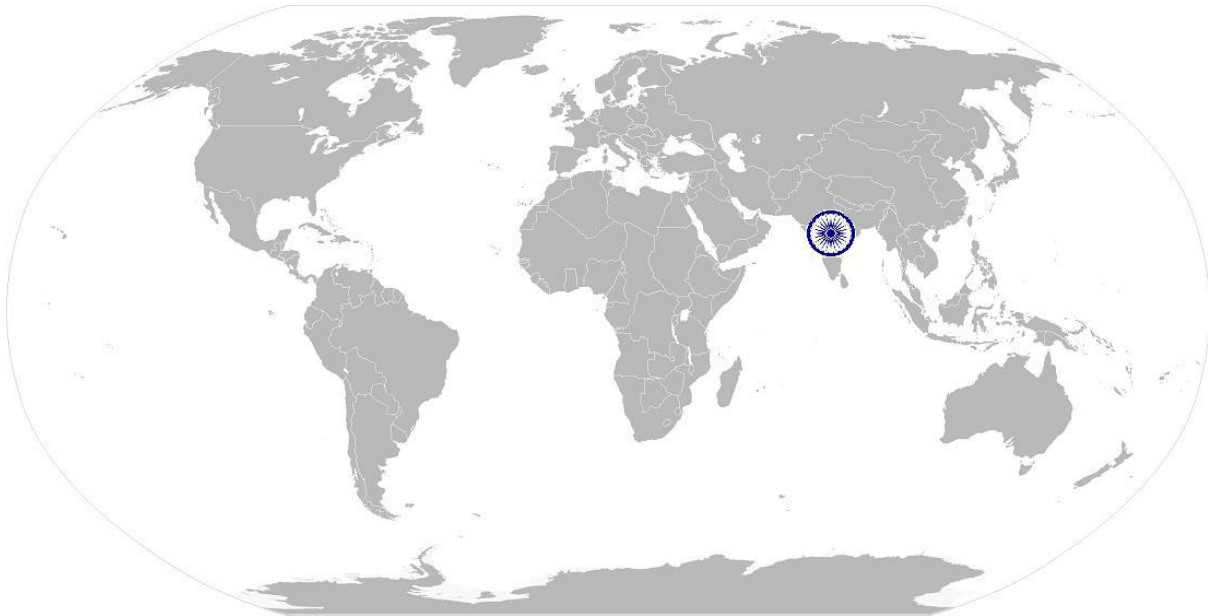
NOS Code	ASC/N3215		
Credits(NSQF)	TBD	Version number	1.0
Industry	Automotive	Drafted on	1/10/2013
Industry Sub-sector	Manufacturing	Last reviewed on	20/10/2013
Occupation	Sand Casting	Next review date	Under revision expected date of revised version 31-dec -15



ASC/N3216

Prepare the machine (apparatus) and auxiliaries

National Occupational Standard



Overview

This unit is about preparing the apparatus for sand mixing, core and mould making and casting and auxiliary apparatus for the process

ASC/N3216

Prepare the machine (apparatus) and auxiliaries

National Occupational Standard

Unit Code	ASC / N3216
Unit Title (Task)	Prepare the machine (apparatus) and auxiliaries
Description	This NOS unit is about selecting the tools and apparatus for various activities within sand casting basis the work order received,
Scope	<p>The operator will be responsible for</p> <ul style="list-style-type: none"> determining the process parameters for making mould and core cleaning the dies and the shell preparing the sand mould and core escalations of any queries regarding the job <p>The job holder will cover all types casting methods . The role holder will interact with the maintenance team and material management team</p>
Performance Criteria(PC) w.r.t. the Scope	
Element	Performance Criteria
Determine the process requirements, tools, equipment and parameters to be used for sand making, core making, mould making and sand casting	<p>PC1. Determine the type of sand and apparatus to be used for making the same to produce desired moulds</p> <p>PC2. Determine the right methodology to prepare cores and moulds and various parameters like temperature, geometric dimensions etc.</p> <p>PC3. Determine the right casting and trimming methodology and process to be adopted for completing the work order</p> <p>PC4. Correctly determine the various casting and trimming parameters like temperature, geometric dimensions etc. before starting the process</p> <p>PC5. Determine the material required and the equipment availability for executing the activity</p>
Clean the dies and equipment & tools before executing the sand making, core making, mould making and casting process and setup the equipment	<p>PC6. Ensure cleaning of machinery like mixers, hoppers, feeders etc by spraying or brushing surfaces with parting agents to ensure smoothness and prevent sticking or seepage</p> <p>PC7. Ensure cleaning of the other machine and tools, auxiliaries (spatulas, chippers etc) before the initiation of the process</p> <p>PC8. Setup the respective apparatus as per the selected sand making/ core making/ mould making/ Casting process and the standards used in the automobile industry</p>
Prepare sand, core, mould and output as per the product specification	<p>PC9. Correctly analyze the geometric specifications for the output and ensure the core, mould and output are in line with product drawing/ sketches available</p> <p>PC10. In case the output is not as per the given measurements, remove extra material by using chippers, grinders etc.</p>
Escalations of queries for the given job	<p>PC11. Immediately refer the queries to a competent internal specialist if they cannot be resolved by the operator on own</p> <p>PC12. Obtain help or advice from specialist if the problem is outside his/her area of competence or experience</p> <p>PC13. Confirm self -understanding to the specialist once the query is resolved so that all doubts & queries can be resolved before the actual process execution</p>
Knowledge and Understanding (K)	

ASC/N3216

Prepare the machine (apparatus) and auxiliaries

A. Organizational Context (Knowledge of the company / organization and its processes)	The user/individual on the job needs to know and understand: KA1. relevant standards and procedures followed in the company KA2. different types of products manufactured by the company KA3. functional processes like Procurement, Store management, inventory management, quality management and key contact points for query resolution
B. Technical Knowledge	The user/individual on the job needs to know and understand: KB1. different types of cleaning techniques, sand making, core making, mould making and sand casting processes and associated equipment KB2. different tools and equipment being used for sand making KB3. different tools and equipment being used for core making KB4. different tools and equipment being used for mould making KB5. different tools and equipment being used for trimming and casting KB6. different types of cleaning agents being commonly used KB7. measuring instruments like verniercalipers, micrometers KB8. sketches and engineering drawings KB9. final product output and hence decide on the key steps to be followed for casting and trimming KB10. basic principles of geometry and drawing
Skills (S) [Optional]	
A. Core Skills/ Generic Skills	Writing Skills
	The user/ individual on the job needs to know and understand how to: SA1. document information from the sketches and engineering drawings SA2. prepare draft drawings for the final output product SA3. write information documents to internal departments/ internal teams or enter the information in online ERP systems under guidance of the supervisor
	Reading Skills
	The user/individual on the job needs to know and understand how to: SA4. read and interpret engineering drawing and sketches SA5. read equipment manuals and process documents to understand the equipment and processes better SA6. read internal information drawings sent by internal customers (other functions within the organization)
B. Professional Skills	Oral Communication (Listening and Speaking skills)
	The user/individual on the job needs to know and understand how to: SA7. discuss task lists, schedules, and work-loads with co-workers SA8. effectively communicate with the team members SA9. question internal customers/ shop supervisor appropriately in order to understand the nature of the problem and make a diagnosis SA10. attentively listen with full attention and comprehend the information given by the speaker
B. Professional Skills	Plan and Organize

ASC/N3216


Prepare the machine (apparatus) and auxiliaries

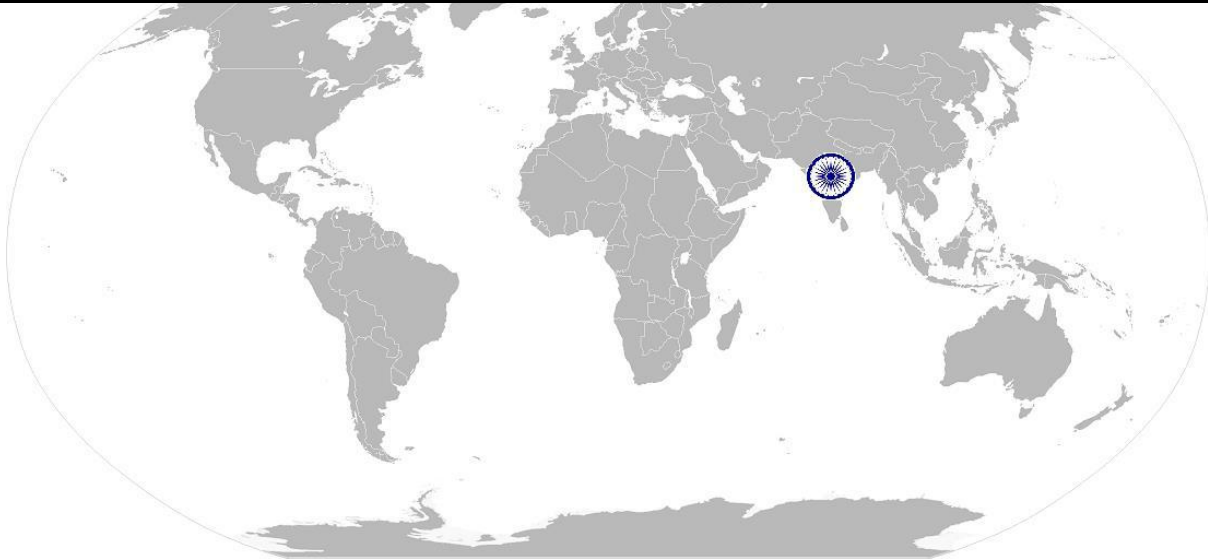
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB1. plan and organize the work order and jobs received from the Operator</p> <p>SB2. organize all process/ equipment manuals so that sorting/ accessing information is easy</p>
	<p>Analytical Thinking</p>
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB3. visualize the final job product after understanding the given drawing/ sketches</p> <p>SB4. analyze the final output and its alignment with the given drawing</p> <p>SB5. finalize the optimum levels of physical parameters so that the job output meets the prescribed job standards</p>
	<p>Judgment and Critical Thinking</p>
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB6. use common sense and make judgments during day to day basis</p> <p>SB7. use reasoning skills to identify and resolve basic problems</p>
	<p>Desire to learn and take initiatives</p>
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB8. follow instructions and work on areas of improvement identified complete the assigned tasks with minimum supervision</p> <p>SB9. complete the job defined by the supervisor within the timelines and quality norms</p> <p>SB10. take self initiatives in driving small projects with the supervisor like operation improvement, training of helpers and assistant operators, 5S, Kaizen etc</p>

ASC/N3216

Prepare the machine (apparatus) and auxiliaries

NOS Version Control

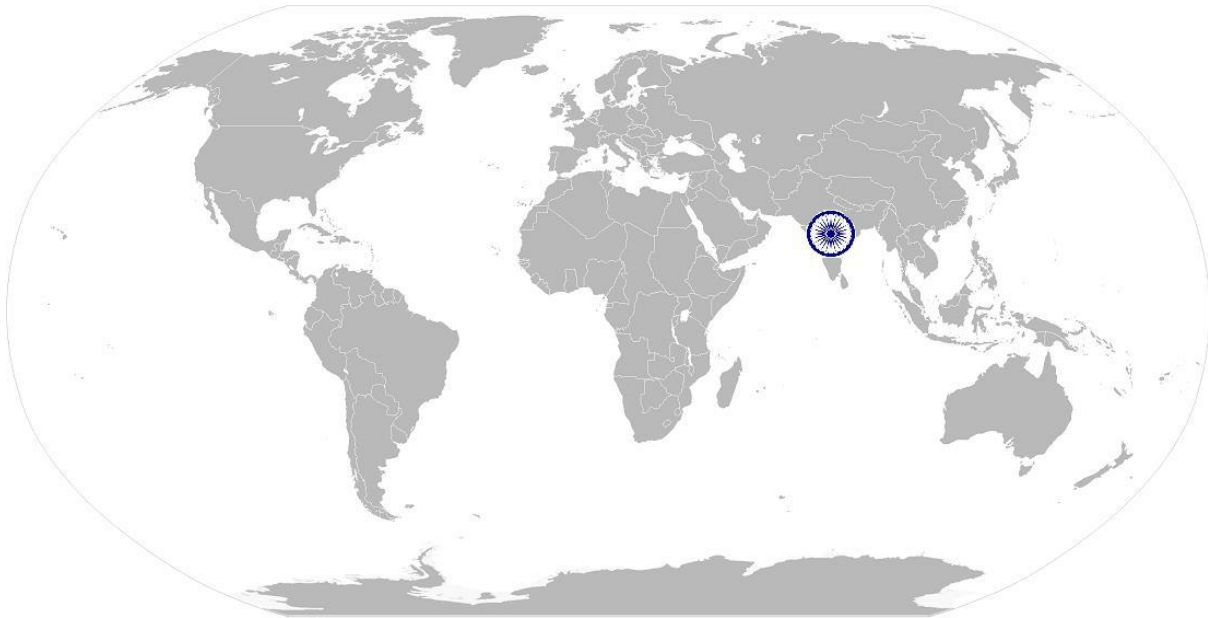
NOS Code	ASC/N3216		
Credits(NSQF)	TBD	Version number	1.0
Industry	Automotive	Drafted on	1/10/2013
Industry Sub-sector	Manufacturing	Last reviewed on	20/10/2013
Occupation	Sand Casting	Next review date	Under revision
			expected date of revised version
			31-dec -15



ASC/N3217

Perform the sand making related operations and monitor process
Parameters

National Occupational Standard



Overview

This unit is about making sandas per the desired specifications and the standards specified by the organization

ASC/N3217

Perform the sand making related operations and monitor process Parameters

National Occupational Standard

Unit Code	ASC / N3217
Unit Title (Task)	Perform the sand making related operations and monitor process parameters
Description	This NOS is about preparing and mixing the sand in line with the required specifications and industry standards
Scope	<p>The operator will be responsible for</p> <ul style="list-style-type: none"> • checking the operations of the equipment • pour the sand into the mixer and prepare the sand • inspecting the sand of the parameters <p>The job holder will cover all types casting methods . The role holder will interact with the maintenance team and material management team</p>
Performance Criteria(PC) w.r.t. the Scope	
Element	Performance Criteria
Check the operations of the equipment used in the sand making	<p>PC1. Check for operation of apparatus for sand feeding and mixing like hoppers, mixers etc. as per the instructions mentioned in the Work Instructions/ SOPs</p> <p>PC2. Make modifications in the machine parameters if required and ensure alignment with the prescribed standards</p>
Pour the sand into mixer	<p>PC3. Instruct assistant operator to turn valves of machines to regulate speed and quantity of the sand</p> <p>PC4. Ensure pouring in line with the defined standards and specifications</p>
Prepare the sand in line with the defined standards	<p>PC5. Feed the mixer with the required additives in the right quantities. The quantity of additives added in the sand should be as per the process requirements mentioned in the Work Instructions/ SOPs</p> <p>PC6. Feed the required operation code in the mixer</p> <p>PC7. Clean and lubricate the machinery to prevent any sand sticking on the mixer/ hopper surface</p>
Check measurement instruments for monitoring process parameters	<p>PC8. Monitor the sand feeding and mixing process by observing and analyzing the readings on various panels/ meters to prevent machine breakdown/ Process stoppage and deviations of the cast from desired specifications</p> <p>PC9. Observe and analyze any irregularity in the process and take preventive steps</p>
Perform the inspection of the sand	<p>PC10. Perform the quality check on output sand in terms of grain compressive strength etc.</p> <p>PC11. In case there are any inconsistencies identified in the properties of the output sand, send the same for further processing</p>
Knowledge and Understanding (K)	
A. Organizational Context (Knowledge of the company / organization and its	<p>The user/individual on the job needs to know and understand:</p> <p>KA1. relevant standards and procedures followed in the company</p> <p>KA2. different types of products manufactured by the company</p> <p>KA3. functional processes like Procurement, Store management, inventory management, quality management and key contact points for query</p>

ASC/N3217

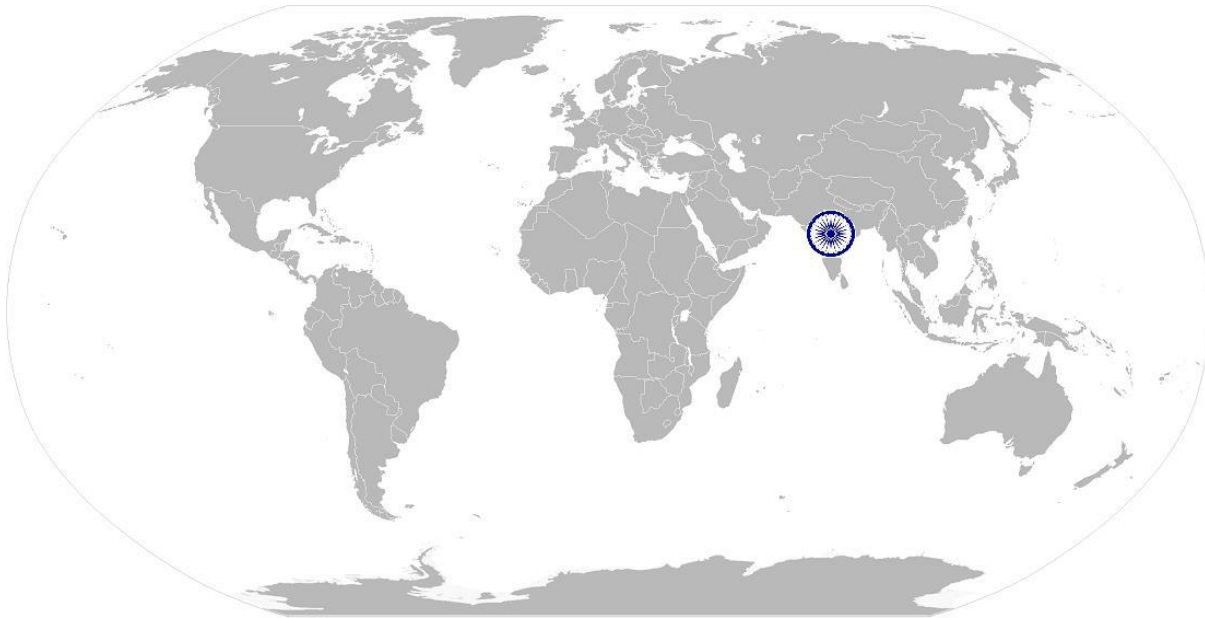
**Perform the sand making related operations and monitor process
Parameters**

processes)	<p>resolution</p> <p>KA4. quality norms prescribed by the organization for sand making jobs</p>
B. Technical Knowledge	<p>The user/individual on the job needs to know and understand:</p> <p>KB1. different types of sand making processes and associated equipment</p> <p>KB2. effect of operators work on output quality at in house and at customers, how to improve customers satisfaction</p> <p>KB3. different parameters pertinent to sand making process like quantity of additives, Sand properties – GCS, Compatibility, Clay and moisture %, Squeeze pressure, metal temperature, inoculation addition, cooling time etc.</p> <p>KB4. properties of sand and other additives</p> <p>KB5. final output sand and hence decide on the key steps to be followed</p> <p>KB6. safety precautions to be taken for all types of activities</p> <p>KB7. mechanical laws and working of machines etc.</p>
Skills (S) [Optional]	
A. Core Skills/ Generic Skills	Writing Skills
	<p>The user/ individual on the job needs to know and understand how to:</p> <p>SA1. write drawings to internal customers on the requirement of sand, additives, apparatus etc.</p> <p>SA2. write log book in terms of output quantity, set up parameters, machine setting parameters and loss details etc.</p> <p>SA3. note measurements, equipment panel readings for various process parameters in the required reporting formats</p>
	Reading Skills
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SA4. read equipment manuals and process documents to understand the equipment and processes better</p> <p>SA5. read instructions especially safety instructions especially symbols while using the equipment in the plant area</p> <p>SA6. read internal drawings send by internal customers (other functions within the organization)</p>
	Oral Communication (Listening and Speaking skills)
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SA7. discuss task lists, schedules, and work-loads with co-workers</p> <p>SA8. question internal customers/ shop supervisor appropriately in order to understand the nature of the problem and make a diagnosis</p>
B. Professional Skills	Plan and Organize
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB1. plan and organize the work order and jobs received from the internal customers</p> <p>SB2. organize all process/ equipment manuals so that sorting out information is fast</p>

ASC/N3217

**Perform the sand making related operations and monitor process
Parameters**

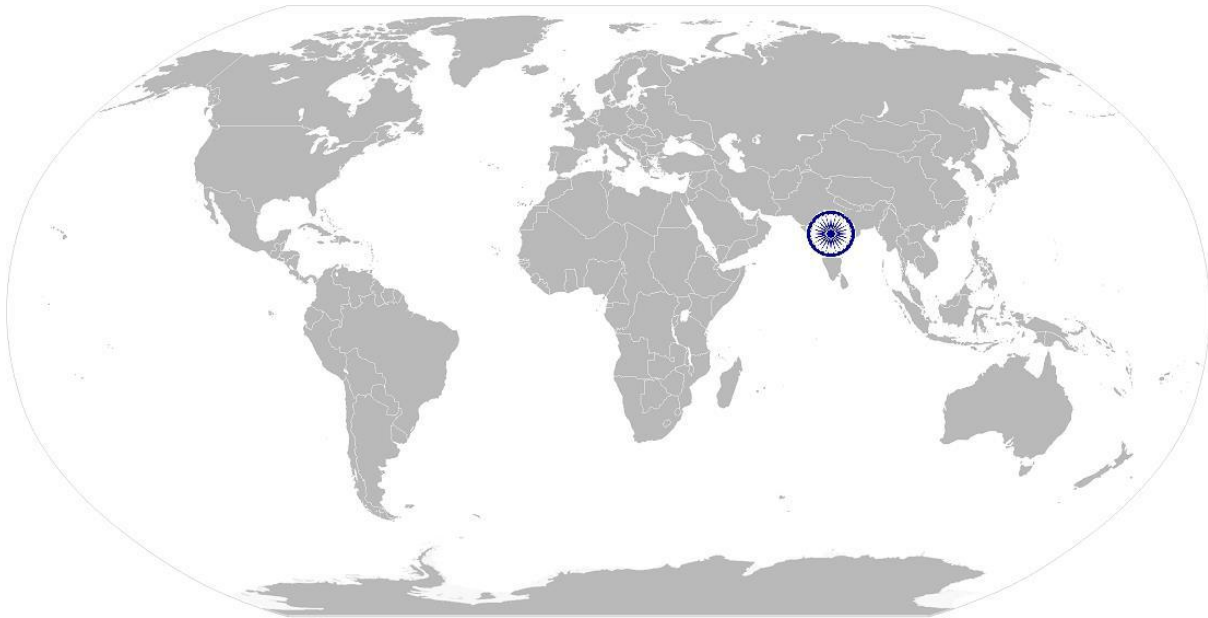
	SB3. organize apparatus etc. in an orderly manner at proper designated areas
	Analytical Thinking
	The user/individual on the job needs to know and understand how to: SB4. analyse the properties of the output sand after understanding the given specifications SB5. finalize the optimum levels of physical parameters so that the output meets the prescribed standards
	Problem solving
	The user/individual on the job needs to know and understand how to: SB6. think through the problem, evaluate the possible solution and suggest the best possible solution to the problem SB7. identify immediate or temporary solutions to resolve delays



ASC/N3217 Perform the sand making related operations and monitor process Parameters

NOS Version Control

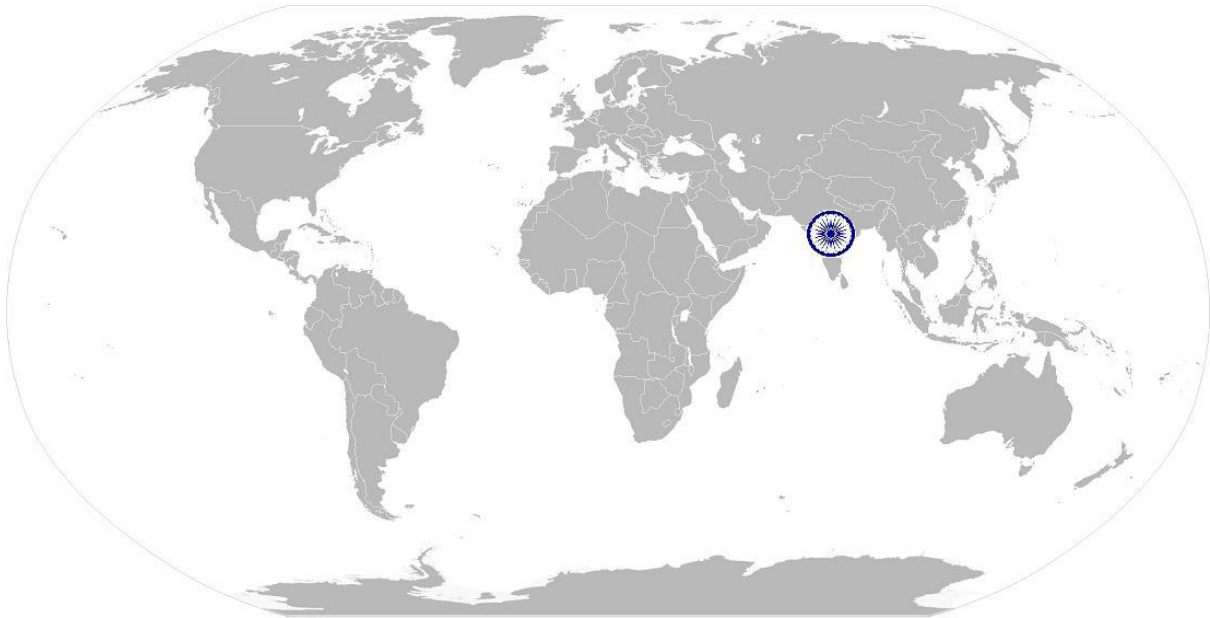
NOS Code	ASC/N3217		
Credits(NSQF)	TBD	Version number	1.0
Industry	Automotive	Drafted on	1/10/2013
Industry Sub-sector	Manufacturing	Last reviewed on	20/10/2013
Occupation	Sand Casting	Next review date	Under revision expected date of revised version 31-dec -15



ASC/N3218

Perform the core making related operations and monitor process parameters

National Occupational Standard



Overview

This unit is about making the sand core as per the desired specifications and the standards specified by the organization

ASC/N3218

Perform the core making related operations and monitor process parameters

National Occupational Standard

Unit Code	ASC / N3218
Unit Title (Task)	Perform the core making related operations and monitor process parameters
Description	This NOS is about preparing the core as per the desired shape and ensure the output in line with the required specifications and industry standards
Scope	<p>The operator will be responsible for</p> <ul style="list-style-type: none"> checking the operations of the equipment pour the sand and additives into the die prepare the core into the die inspecting the core for the parameters <p>The job holder will cover all types casting methods . The role holder will interact with the maintenance team and material management team</p>
Performance Criteria(PC) w.r.t. the Scope	
Element	Performance Criteria
Check the operations of the equipment used in preparing the core	<p>PC1. Check for operation of core making apparatus like hoppers, pouring nozzles, mixers, pressing machines etc.</p> <p>PC2. Make modifications in the machine related parameters if required and ensure alignment with the prescribed standards</p>
Pour the sand and additives required into die	<p>PC3. Turn valves (like butterfly valve) machines to regulate flow of additives and sand into the die</p> <p>PC4. Ensure pouring in line with the defined standards and specifications</p>
Conduct the actual core making process	<p>PC5. Ensure that the right type of die is put in the machine.</p> <p>PC6. Ensure escalation of any issues related to die setting to the machine setter in the plant</p> <p>PC7. Feed the required operation code in the pressing machine for it to prepare the core</p> <p>PC8. Adjust the temperature, pressure and other parameters as per the core's requirement</p> <p>PC9. Monitor the process parameters and ensure that the cycle time of the process is as per the Work Instructions/ SOPs</p> <p>PC10. Ensure proper hardening of the core by creating hot vapor within the core making process</p> <p>PC11. Withdraw the output core carefully from the machine at the end of the core making cycle time</p> <p>PC12. Turn valves to circulate high pressure air to clean the die</p> <p>PC13. Blow air jet on core to remove impurities or additional material stuck in between die/ machine parts which can hamper future casting operations</p>
Perform painting of the core	<p>PC14. Instruct helper to prepare the water based paint for core</p> <p>PC15. Check the viscosity and other properties of paint</p> <p>PC16. Dip the core into paint tank and remove the same once coated with paint</p> <p>PC17. Put the painted core into heater/ combustion zone for hardening</p>

ASC/N3218

Perform the core making related operations and monitor process parameters

<p>Remove surface imperfections using Shot Blasting technique</p>	<p>PC18. Clean the shot blasting machine using Air pressure blast to remove any dust particles and any unwanted material</p> <p>PC19. Load the components and the shots in the chamber of the shot blasting machine</p> <p>PC20. Ensure that the door of the shot blasting machine is tightly closed</p> <p>PC21. Switch ON the Shot Blasting machine and ensure that all auxiliary motors are in the ON position</p> <p>PC22. Keep the machine in the moving position till the cycle time prescribed in the Work Instructions/ SOP manual</p> <p>PC23. Switch OFF the machine and inspect the parts. Turn the parts into the opposite side. Ensure that all the parts in the current position are completely turned in the opposite direction</p> <p>PC24. Keep the machine moving till the prescribed cycle time is achieved. Ensure that the cycle time get completed for both the cycles.</p> <p>PC25. Open the Shot Blasting machine and carefully remove the components from the machine and load them into the designated trolley</p> <p>PC26. Ensure that the machine is again cleaned using an Air Blasting machine</p>
<p>Check measurement instruments for monitoring process parameters</p>	<p>PC27. Monitor the core making process (right from sand feeding till core hardening) by observing and analyzing the readings on various panels/ meters to prevent machine breakdown and deviations of the output core from desired specifications</p> <p>PC28. Observe and analyze any irregularity in the process and take preventive steps</p>
<p>Perform the visual inspection of the output to further finish the core</p>	<p>PC29. Measure the final core and compare the dimensions as prescribed in the work order engineering drawing</p> <p>PC30. In case the core is not as per the given measurements, send the same for further processing</p>
<p>Knowledge and Understanding (K)</p>	
<p>A. Organizational Context (Knowledge of the company / organization and its processes)</p>	<p>The user/individual on the job needs to know and understand:</p> <p>KA1. relevant standards and procedures followed in the company</p> <p>KA2. different types of products manufactured by the company</p> <p>KA3. functional processes like Procurement, Store management, inventory management, quality management and key contact points for query resolution</p> <p>KA4. quality norms prescribed by the organization for core making jobs</p>
<p>B. Technical Knowledge</p>	<p>The user/individual on the job needs to know and understand:</p> <p>KB1. different types equipment for core making</p> <p>KB2. different parameters pertinent to core making process like Temperature, Pressure etc.</p> <p>KB3. effect of operators work on output quality at in house and at customers, how to improve customers satisfaction</p> <p>KB4. different types of paints to be used for painting the core</p> <p>KB5. measuring instruments like vernier calipers, micrometer</p> <p>KB6. geometry and dimensions of the core being manufactured</p> <p>KB7. sketches and engineering drawings</p>

ASC/N3218

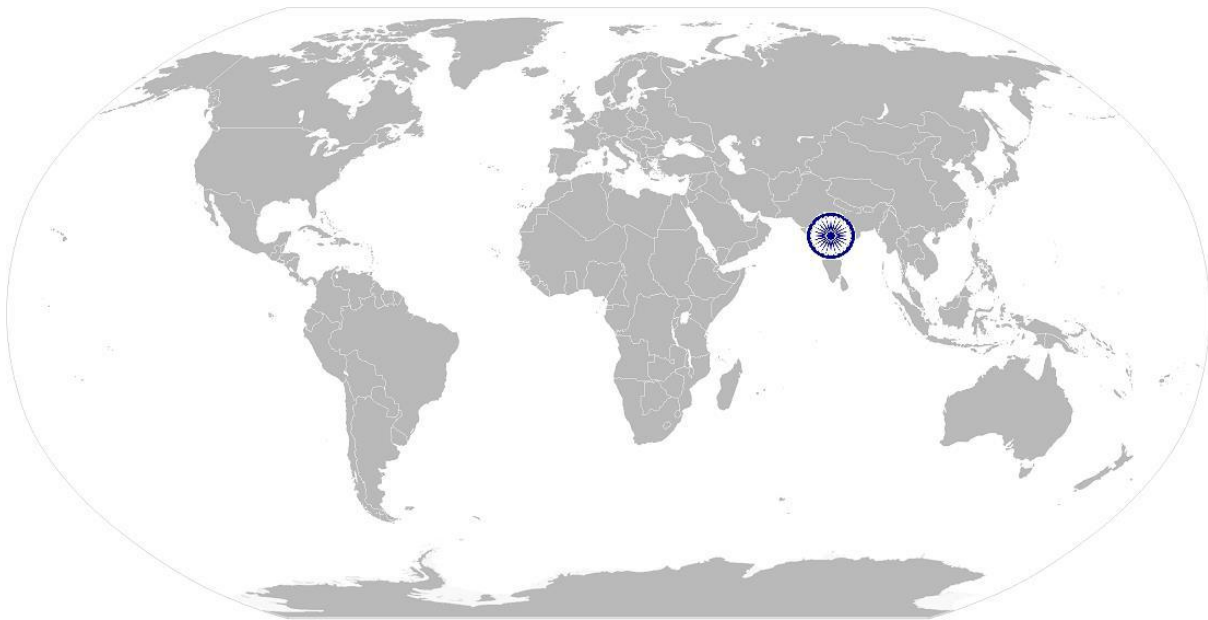
Perform the core making related operations and monitor process parameters

	<p>KB8. how to visualize the final product output and hence decide on the key steps to be followed</p> <p>KB9. safety precautions to be taken for all types of core making activities</p> <p>KB10. mechanical laws and working of pressing/ other machines etc.</p>
Skills (S) [Optional]	
<p>C. Core Skills/ Generic Skills</p>	<p>Writing Skills</p>
	<p>The user/ individual on the job needs to know and understand how to:</p> <p>SA1. document information from the sketches and engineering drawings</p> <p>SA2. write log book in terms of output quantity, set up parameters, machine setting parameters and loss details etc.</p> <p>SA3. prepare draft drawings for the final output product</p> <p>SA4. write drawings to internal customers on the requirement of sand, additives, core making apparatus etc.</p> <p>SA5. note measurements, equipment panel readings for various process parameters in the required reporting formats</p>
	<p>Reading Skills</p>
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SA6. read and interpret engineering drawing and sketches</p> <p>SA7. read equipment manuals and process documents to understand the equipments and processes better</p> <p>SA8. read instructions especially safety instructions especially symbols while using the equipments in the plant area</p> <p>SA9. read internal drawings send by internal customers (other functions within the organization)</p>
	<p>Oral Communication (Listening and Speaking skills)</p>
<p>The user/individual on the job needs to know and understand how to:</p> <p>SA10. discuss task lists, schedules, and work-loads with co-workers</p> <p>SA11. question internal customers/ shop supervisor appropriately in order to understand the nature of the problem and make a diagnosis</p>	
<p>D. Professional Skills</p>	<p>Plan and Organize</p>
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB1. plan and organize the work order and jobs received from the internal customers</p> <p>SB2. plan and organize the design documents received from internal customers</p> <p>SB3. organize all process/ equipment manuals so that sorting out information is fast</p> <p>SB4. organize apparatus etc. in an orderly manner at proper designated areas</p>
	<p>Analytical Thinking</p>
<p>The user/individual on the job needs to know and understand how to:</p> <p>SB5. visualize the final job product after understanding the given drawing/ sketches</p>	

ASC/N3218

Perform the core making related operations and monitor process parameters

	SB6. carefully measure the core so in terms of the geometrical dimensions so that the final output is as pre the given drawing
	SB7. finalize the optimum levels of physical parameters so that the job output meets the prescribed job standards
	Problem solving
	The user/individual on the job needs to know and understand how to:
	SB8. think through the problem, evaluate the possible solution and suggest the best possible solution to the problem
	SB9. identify immediate or temporary solutions to resolve delays

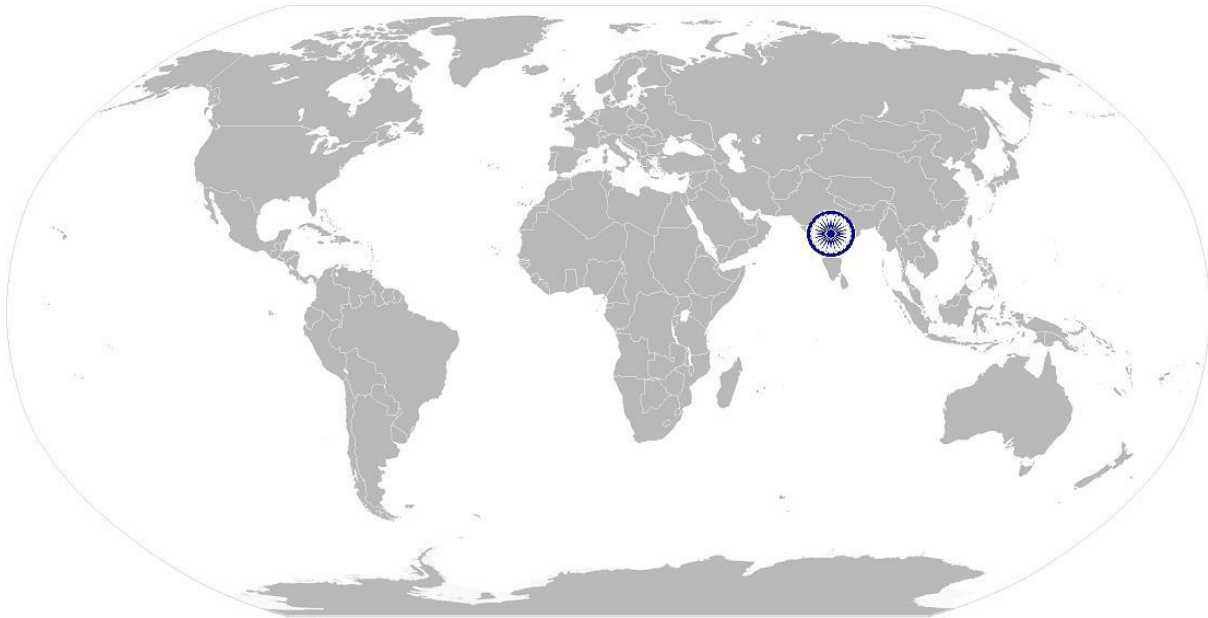


ASC/N3218

Perform the core making related operations and monitor process parameters

NOS Version Control

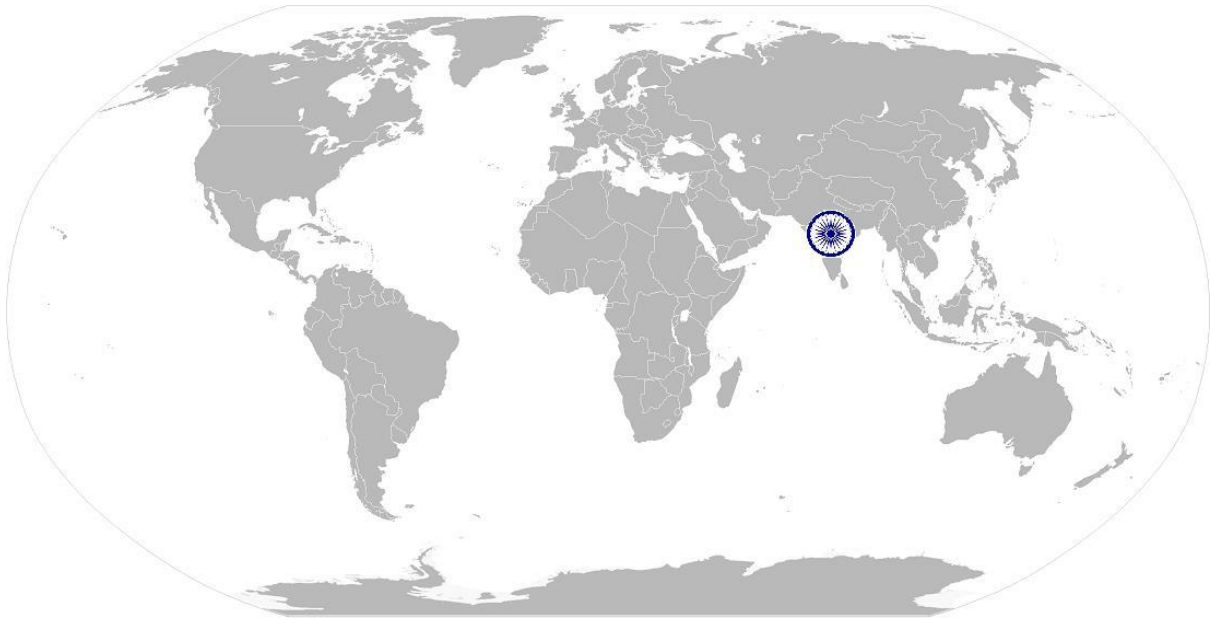
NOS Code	ASC/N3218		
Credits(NSQF)	TBD	Version number	1.0
Industry	Automotive	Drafted on	1/10/2013
Industry Sub-sector	Manufacturing	Last reviewed on	20/10/2013
Occupation	Sand Casting	Next review date	Under revision expected date of revised version 31-dec -15



ASC/N3219

Perform the mould making related operations and monitor process parameters

National Occupational Standard



Overview

This unit is about making the mould as per the desired specifications and the standards specified by the organization

ASC/N3219

Perform the mould making related operations and monitor process parameters

National Occupational Standard

Unit Code	ASC / N3219
Unit Title (Task)	Perform the mould making related operations and monitor process parameters
Description	This NOS is about preparing the mould as per the desired pattern and ensure the output in line with the required specifications and industry standards
Scope	<p>The operator will be responsible for</p> <ul style="list-style-type: none"> • checking the operations of the equipment • pour the sand and additives into the die • prepare the mould • inspecting the mould for the parameters <p>The job holder will cover all types casting methods . The role holder will interact with the maintenance team and material management team</p>
Performance Criteria(PC) w.r.t. the Scope	
Element	Performance Criteria
Check the operations of the equipment used in preparing the mould	<p>PC1. Check for operation of mouldmaking apparatus like hoppers, pouring nozzles, mixers, pressing machines etc.</p> <p>PC2. Make modifications in the machine related parameters if required and ensure alignment with the prescribed standards</p>
Pour the sand and additives required into die	<p>PC3. Turn valves (like butterfly valve) machines to regulate flow of additives and sand into the die</p> <p>PC4. Ensure pouring in line with the defined standards and specifications</p>
Conduct the actual mould making process	<p>PC5. Ensure that the right type of die is put in the machine.</p> <p>PC6. Ensure escalation of any issues related to die setting to the machine setter in the plant</p> <p>PC7. Check the mould making machine as per the checklist provided at the working place</p> <p>PC8. Adjust the temperature, pressure and other parameters as per the output mould requirement</p> <p>PC9. Feed the required operation code in the pressing machine for it to prepare the mould</p> <p>PC10. Withdraw the output mould carefully from the machine</p> <p>PC11. Prepare the mould box (combination of core and mould with a metal jacket on it) for casting of metal</p> <p>PC12. Ensure that the two halves of the mould box do not move while pouring operations of the molten metal are in process</p> <p>PC13. Turn valves to circulate jet to clean the die</p> <p>PC14. Blow air jet on mould to remove impurities or additional material between the cavities</p>
Check measurement instruments for monitoring process parameters	<p>PC15. Monitor the mould making process (right from sand feeding till mould preparation) by observing and analyzing the readings on various panels/ meters to prevent machine breakdown and deviations of the output mould pattern from desired specifications</p> <p>PC16. Observe and analyze any irregularity in the process and take preventive</p>

ASC/N3219

Perform the mould making related operations and monitor process parameters

	steps
Perform the visual inspection of the output to further finish the mould	<p>PC17. Measure the final mould pattern and compare the dimensions as prescribed in the work order engineering drawing</p> <p>PC18. In case the mould is not as per the given measurements, send the same for further processing</p>
Knowledge and Understanding (K)	
B. Organizational Context (Knowledge of the company / organization and its processes)	<p>The user/individual on the job needs to know and understand:</p> <p>KA1. relevant standards and procedures followed in the company</p> <p>KA2. different types of products manufactured by the company</p> <p>KA3. functional processes like Procurement, Store management, inventory management, quality management and key contact points for query resolution</p> <p>KA4. quality norms prescribed by the organization for mould making jobs</p>
B. Technical Knowledge	<p>The user/individual on the job needs to know and understand:</p> <p>KB1. different types equipment for mould making</p> <p>KB2. different parameters pertinent to mould making process like Temperature, Pressure etc</p> <p>KB3. effect of operators work on output quality at in house and at customers, how to improve customers satisfaction</p> <p>KB4. measuring instruments like verniercalipers, micrometer</p> <p>KB5. geometry and dimensions</p> <p>KB6. sketches and engineering drawings</p> <p>KB7. final product output and hence decide on the key steps to be followed</p> <p>KB8. safety precautions to be taken for all types of core making activities</p> <p>KB9. mechanical laws and working of pressing/ other machines etc</p>
Skills (S) [Optional]	
E. Core Skills/ Generic Skills	Writing Skills
	<p>The user/ individual on the job needs to know and understand how to:</p> <p>SA1. document information from the sketches and engineering drawings</p> <p>SA2. write log book in terms of output quantity, set up parameters, machine setting parameters and loss details etc.</p> <p>SA3. prepare draft drawings for the final output product</p> <p>SA4. write drawings to internal customers on the requirement of sand, additives, mould making apparatus etc.</p> <p>SA5. note measurements, equipment panel readings for various process parameters in the required reporting formats</p>
	Reading Skills
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SA6. read and interpret engineering drawing and sketches</p> <p>SA7. read equipment manuals and process documents to understand the equipments and processes better</p>

ASC/N3219

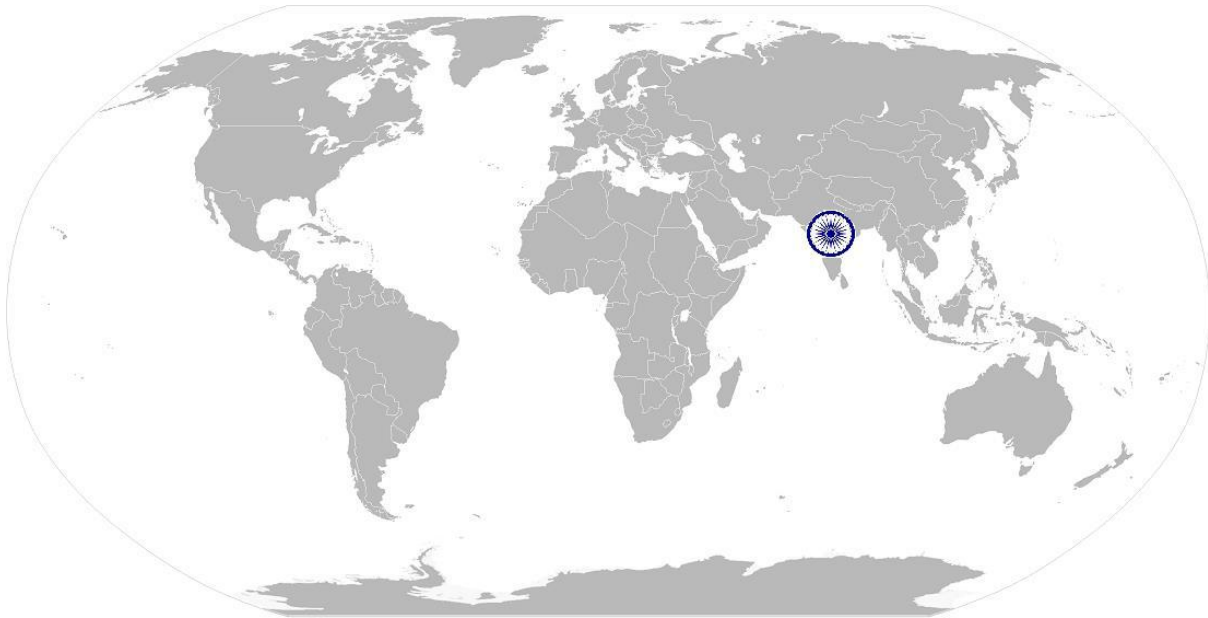
Perform the mould making related operations and monitor process parameters

	SA8. read instructions especially safety instructions especially symbols while using the equipments in the plant area
	SA9. read internal drawings send by internal customers (other functions within the organization)
	Oral Communication (Listening and Speaking skills)
	The user/individual on the job needs to know and understand how to: SA10. discuss task lists, schedules, and work-loads with co-workers SA11. question internal customers/ shop supervisor appropriately in order to understand the nature of the problem and make a diagnosis
F. Professional Skills	Plan and Organize
	The user/individual on the job needs to know and understand how to: SB1. plan and organize the work order and jobs received from the internal customers SB2. plan and organize the design documents received from internal customers SB3. organize all process/ equipment manuals so that sorting out information is fast SB4. organize apparatus etc. in an orderly manner at proper designated areas
	Analytical Thinking
	The user/individual on the job needs to know and understand how to: SB5. visualize the final job product after understanding the given drawing/ sketches SB6. carefully measure the pattern of mould so in terms of the geometrical dimensions so that the final output is as pre the given drawing SB7. finalize the optimum levels of physical parameters so that the job output meets the prescribed job standards
	Problem solving
	The user/individual on the job needs to know and understand how to: SB8. think through the problem, evaluate the possible solution and suggest the best possible solution to the problem SB9. identify immediate or temporary solutions to resolve delays

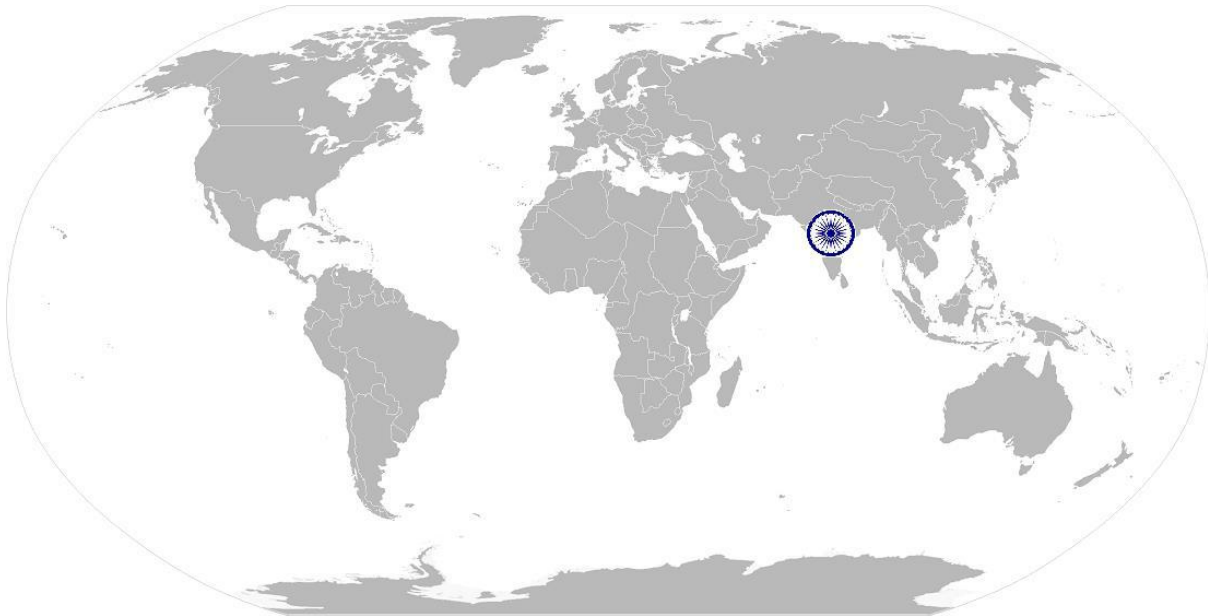
ASC/N3219 Perform the mould making related operations and monitor process parameters

NOS Version Control

NOS Code	ASC/N3219		
Credits(NSQF)	TBD	Version number	1.0
Industry	Automotive	Drafted on	1/10/2013
Industry Sub-sector	Manufacturing	Last reviewed on	20/10/2013
Occupation	Sand Casting	Next review date	Under revision expected date of revised version 31-dec -15



National Occupational Standard



Overview

This unit is about obtaining the final casts as per the output specifications and the standards specified by the organization

Perform the sand casting related operations and monitor process parameters

Unit Code	ASC / N3220
Unit Title (Task)	Perform the sand casting related operations and monitor process parameters
Description	This NOS is about obtaining desired shape and ensure finishing of the output in line with the required specifications and industry standards
Scope	<p>The operator will be responsible for</p> <ul style="list-style-type: none"> • checking the operations of the equipment • pour the molten metal into the mould • conduct the actual sand casting process • inspecting the cast for the parameters <p>The job holder will cover all types casting methods . The role holder will interact with the maintenance team, machining and material management team</p>
Performance Criteria(PC) w.r.t. the Scope	
Element	Performance Criteria
Check the operations of the equipment used in the sandcasting process	<p>PC1. Check for operation of casting apparatus like Molten metal carrying bucket, pouring nozzles, ladles etc.</p> <p>PC2. Ensure casting parameters are as per the batch specifications laid down by the laboratory team</p> <p>PC3. Make modifications in the casting parameters if required and ensure alignment with the prescribed standards</p>
Pour the metal into mould	<p>PC4. Turn valves of machines to regulate speed of the metal into moulds through runners</p> <p>PC5. Ensure pouring in line with the defined work standards and specifications and minimization of metal spillage in the work area; Record the pouring observations like parting leak, gas evolution, interrupted pouring or any abnormality</p> <p>PC6. Maintain downsprue always full during pouring as per the process mentioned in the work instructions/ SOPs</p> <p>PC7. Ensure metal stream inoculation per each mould</p>
Conduct the actual sandcasting process	<p>PC8. Turn valves to circulate water through cores, or spray water on filled molds to cool and solidify metal (in case of manual solidification)</p> <p>PC9. Remove the sand moulds with metal casted in the desired shape</p> <p>PC10. Clean and lubricate metal casts and machinery as specified in the Work Instructions/ SOPs</p> <p>PC11. Stamp the cast with the identifying information (wherever required) and send the same for further processing</p>
Check measurement instruments for monitoring casting process parameters	<p>PC12. Monitor the casting process (parameters like temperature etc.) by observing and analyzing the readings on various panels/ meters to prevent machine breakdown and deviations of the cast from desired specifications</p> <p>PC13. Observe and analyze any irregularity in the process and take preventive steps</p> <p>PC14. Check the in line composition/ soundness of the casting</p>

Perform the sand casting related operations and monitor process parameters

<p>Perform Post casting operations</p>	<p>PC15. Pull out the entire mould with solidified metal from the machine PC16. Hammer out the sand to obtain metal casting after a lapse of definite time PC17. Use wedge cutting machines to separate the cast runner from the prepared casts PC18. Perform cleaning of the metal casting through air/ water jet</p>
<p>Perform the visual inspection of the output to further finish the casting</p>	<p>PC19. Measure the final metal casting and compare the dimensions as prescribed in the work order engineering drawing PC20. In case the parts are not as per the given measurements, send the same for further processing in terms of chipping, fettling, wedge cutting etc.</p>
<p>Remove surface imperfections using Shot Blasting technique</p>	<p>PC21. Clean the shot blasting machine using Air pressure blast to remove any dust particles and any unwanted material PC22. Load the components and the shots in the chamber of the shot blasting machine PC23. Ensure that the door of the shot blasting machine is tightly closed PC24. Switch ON the Shot Blasting machine and ensure that all auxiliary motors are in the ON position PC25. Keep the machine in the moving position till the cycle time prescribed in the Work Instructions/ SOP manual PC26. Switch OFF the machine and inspect the parts. Turn the parts into the opposite side. Ensure that all the parts in the current position are completely turned in the opposite direction PC27. Keep the machine moving till the prescribed cycle time is achieved. Ensure that the cycle time get completed for both the cycles. PC28. Open the Shot Blasting machine and carefully remove the components from the machine and load them into the designated trolley PC29. Ensure that the machine is again cleaned using an Air Blasting machine</p>
<p>Knowledge and Understanding (K)</p>	
<p>B. Organizational Context (Knowledge of the company / organization and its processes)</p>	<p>The user/individual on the job needs to know and understand: KA1. relevant standards and procedures followed in the company KA2. different types of products manufactured by the company KA3. functional processes like Procurement, Store management, inventory management, quality management and key contact points for query resolution KA4. quality norms prescribed by the organization for casting jobs</p>
<p>B. Technical Knowledge</p>	<p>KB1. The user/individual on the job needs to know and understand: KB2. different types of casting processes and associated equipment KB3. different parameters pertinent to casting process like casting hardness, tensile strength, elongation and microstructure requirement etc. KB4. casting defects and how they are generated, how they can be prevented, knowledge of different raw materials, ferrous alloys and consumables used in the melt shop KB5. furnace operation, melting process, charging method and safety process of handling hot liquid iron, furnace lining process and control KB6. measuring instruments like vernier callipers, micrometer and other measurement systems</p>

Perform the sand casting related operations and monitor process parameters

	<p>KB7. metallurgical properties of the metal used in the process</p> <p>KB8. effect of operators work on casting quality at in house and at customers, how to improve customers satisfaction</p> <p>KB9. geometry and dimensions</p> <p>KB10. sketches and engineering drawings</p> <p>KB11. final product output and hence decide on the key steps to be followed</p> <p>KB12. safety precautions to be taken for all types of casting activities</p> <p>KB13. mechanical laws and working of machines etc.</p>
<p>Skills (S) [Optional]</p>	
<p>G. Core Skills/ Generic Skills</p>	<p>Writing Skills</p> <p>The user/ individual on the job needs to know and understand how to:</p> <p>SA1. document information from the sketches and engineering drawings</p> <p>SA2. write log book in terms of output quantity, set up parameters, machine setting parameters and loss details etc.</p> <p>SA3. prepare draft drawings for the final output product</p> <p>SA4. write drawings to internal customers on the requirement of casting metal, casting apparatus etc.</p> <p>SA5. note measurements, equipment panel readings for various process parameters in the required reporting formats</p> <p>Reading Skills</p> <p>The user/individual on the job needs to know and understand how to:</p> <p>SA6. read and interpret engineering drawing and sketches</p> <p>SA7. read equipment manuals and process documents to understand the equipment and processes better</p> <p>SA8. read instructions especially safety instructions especially symbols while using the equipment in the plant area</p> <p>SA9. read internal drawings send by internal customers (other functions within the organization)</p> <p>Oral Communication (Listening and Speaking skills)</p> <p>The user/individual on the job needs to know and understand how to:</p> <p>SA10. discuss task lists, schedules, and work-loads with co-workers</p> <p>SA11. question internal customers/ shop supervisor appropriately in order to understand the nature of the problem and make a diagnosis</p>
<p>H. Professional Skills</p>	<p>Plan and Organize</p> <p>The user/individual on the job needs to know and understand how to:</p> <p>SB1. plan and organize the work order and jobs received from the internal customers</p> <p>SB2. plan and organize the design documents received from internal customers</p> <p>SB3. organize all process/ equipment manuals so that sorting out information is fast</p> <p>SB4. organize apparatus etc. in an orderly manner at proper designated areas</p> <p>Analytical Thinking</p>

Perform the sand casting related operations and monitor process parameters

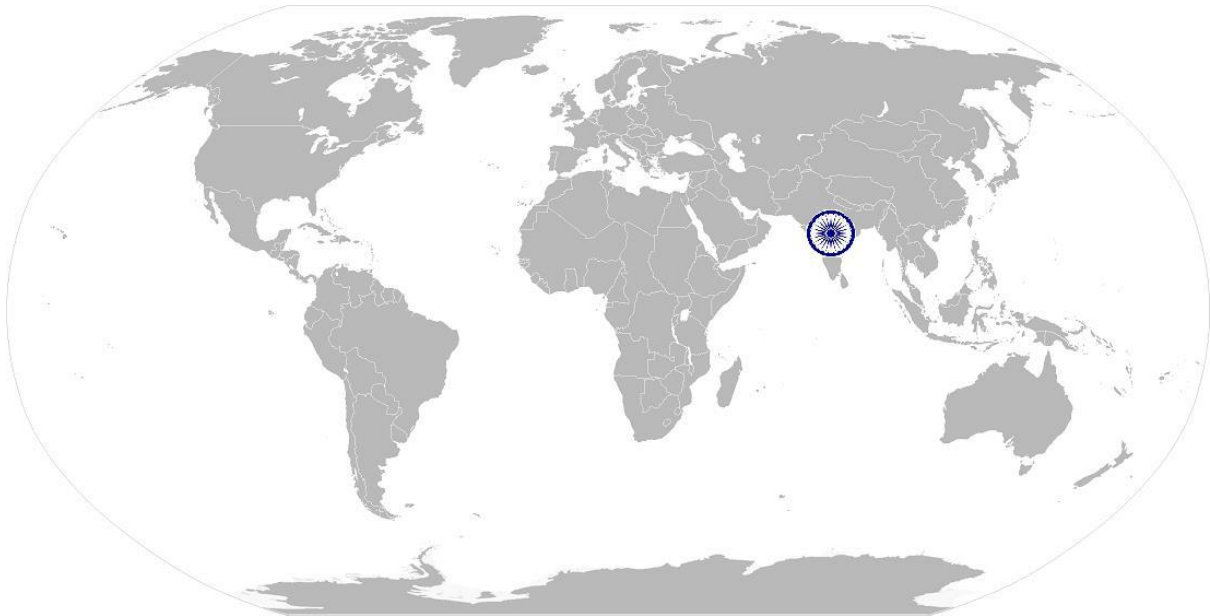
	The user/individual on the job needs to know and understand how to:
	<p>SB5. visualize the final job product after understanding the given drawing/ sketches</p> <p>SB6. carefully measure the casting so in terms of the geometrical dimensions so that the final output is as pre the given drawing</p> <p>SB7. finalize the optimum levels of physical parameters so that the job output meets the prescribed job standards</p>
	Problem solving
	The user/individual on the job needs to know and understand how to:
	<p>SB8. think through the problem, evaluate the possible solution and suggest the best possible solution to the problem</p> <p>SB9. identify immediate or temporary solutions to resolve delays</p>

NOS Version Control

NOS Code	ASC/N3220		
Credits(NSQF)	TBD	Version number	1.0
Industry	Automotive	Drafted on	1/10/2013
Industry Sub-sector	Manufacturing	Last reviewed on	20/10/2013
Occupation	Sand Casting	Next review date	Under revision expected date of revised version 31-dec -15

ASC/N3221 Conduct quality checks and inspection of the finished sand cast products

National Occupational Standard



Overview

This unit is about conducting Quality Checks and inspection of the finished products produced and repair the bad quality items produced in the manufacturing process

ASC/N3221 Conduct quality checks and inspection of the finished sand cast products

National Occupational Standard

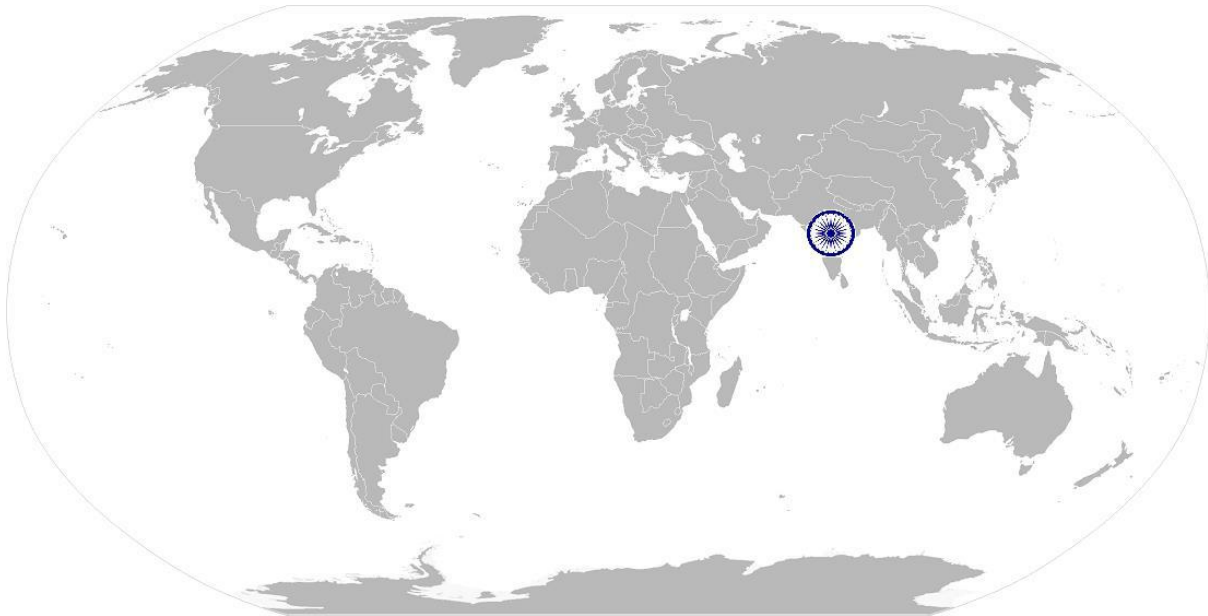
Unit Code	ASC / N3221
Unit Title (Task)	Conduct quality checks and inspection of the finished sand cast products
Description	This NOS is about inspecting the finished goods produced for any damages, deformities and Further repairing the parts produced so that the damaged/ defective pieces can be corrected and right quality components are supplied to 1. The customer/ end user 2. Internal manufacturing team
Scope	The operator will be responsible for <ul style="list-style-type: none"> inspection of finished goods to detect any deviations record logs of defective products repair the pieces with minor defects The job holder will cover all types casting methods . The role holder will interact with the maintenance team, machining and material management team
Performance Criteria(PC) w.r.t. the Scope	
Element	Performance Criteria
Inspection of finished goods to detect any deviations from the product design	PC1. Measure the specifications of the finished product using devices like micrometer, verniercalipers, gauges, rulers, weighing scales and any other inspection equipment and compare with the parameters given in the work order PC2. Compare texture, color, surface properties, hardness and strength with the given product specifications
Record log of defective products and discard defective pieces	PC3. Note down the observations of the basic inspection process and identify pieces which are OK and also not meeting the specified standards PC4. Separate the defective pieces into two categories – pieces which can be repaired/ modified and pieces which are beyond repair PC5. Discard the pieces which are beyond repair and repair the ones which need minor modifications/ rework PC6. Maintain records of each category of work outputs PC7. Establish linkage between rejection of output and the pertinent causes for the same (process/ material etc.); Recommend the means for rejection control
Repair the pieces with minor defects	PC8. Rectify minor defects like excess slag, shape deformation, sharp edges, rough surfaces, grooves, holes etc. by Fettling, chipping, cutting, sawing, filling, shearing, hammering etc. PC9. Escalate all issues related to change in colour, surface properties, hardness etc. so that the manufacturing equipment can be reset to achieve the specified output
Perform Batch Quality Procedure	PC10. Provide first and last casting from each batch to the lab for quality check on its composition, soundness, nodularity etc. PC11. Obtain batch clearance from the lab
Knowledge and Understanding (K)	

ASC/N3221Conduct quality checks and inspection of the finished sand cast products

A. Organizational Context (Knowledge of the company / organization and its processes)	The user/individual on the job needs to know and understand: KA1. relevant standards specified for the manufacturing process KA2. basic process followed for inspection of the pieces KA3. quality Management policy of the organization
B. Technical Knowledge	The user/individual on the job needs to know and understand: KB1. processes and procedures followed for manufacturing the components/ prices/ products KB2. techniques of using measurement instruments like rulers, verniercalipers, micrometer, weighing scales etc. KB3. methods to identify quality defects in work pieces KB4. methods used for cutting, shearing, hammering, drilling which can repair pieces with minor defects KB5. various standards in India (ISO)
Skills (S) [Optional]	
A. Core Skills/ Generic Skills	Writing Skills
	The user/ individual on the job needs to know and understand how to: SA1. note the number of pieces with defects which can be repaired to number of pieces which will be discarded
	Reading Skills
	The user/individual on the job needs to know and understand how to: SA2. read process and equipment manuals to understand the working of the equipment SA3. read measuring instruments reading to identify any deviations from the dimensions given in the product engineering drawing
	Oral Communication (Listening and Speaking skills)
	The user/individual on the job needs to know and understand how to: SA4. inform supervisor of any quality related defects arising out of the manufacturing process SA5. question internal customers/ Shop supervisor appropriately in order to understand the nature of the problem and make a diagnosis
B. Professional Skills	Plan and Organize
	The user/individual on the job needs to know and understand how to: SB1. plan and organize the work order and jobs received from the operator SB2. organize all process/ equipment manuals so that sorting/ accessing information is easy
	Analytical Thinking
	The user/individual on the job needs to know and understand how to: SB3. visualize the final job product after understanding the given

ASC/N3221 Conduct quality checks and inspection of the finished sand cast products

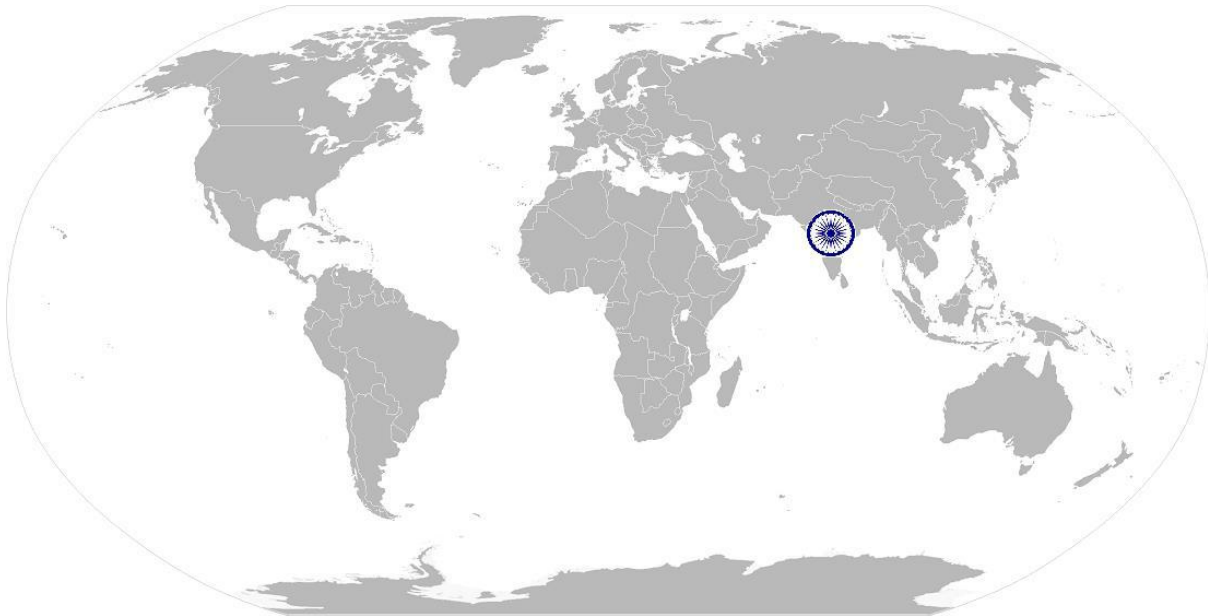
	<p>drawing/ sketches SB4. co relate the type of job output required with the methodology to be used</p>
	<p>Critical Thinking and Judgment</p> <p>The user/individual on the job needs to know and understand how to: SB5. use common sense and make judgments during day to day basis SB6. use reasoning skills to identify and resolve basic problems</p>



NOS Version Control

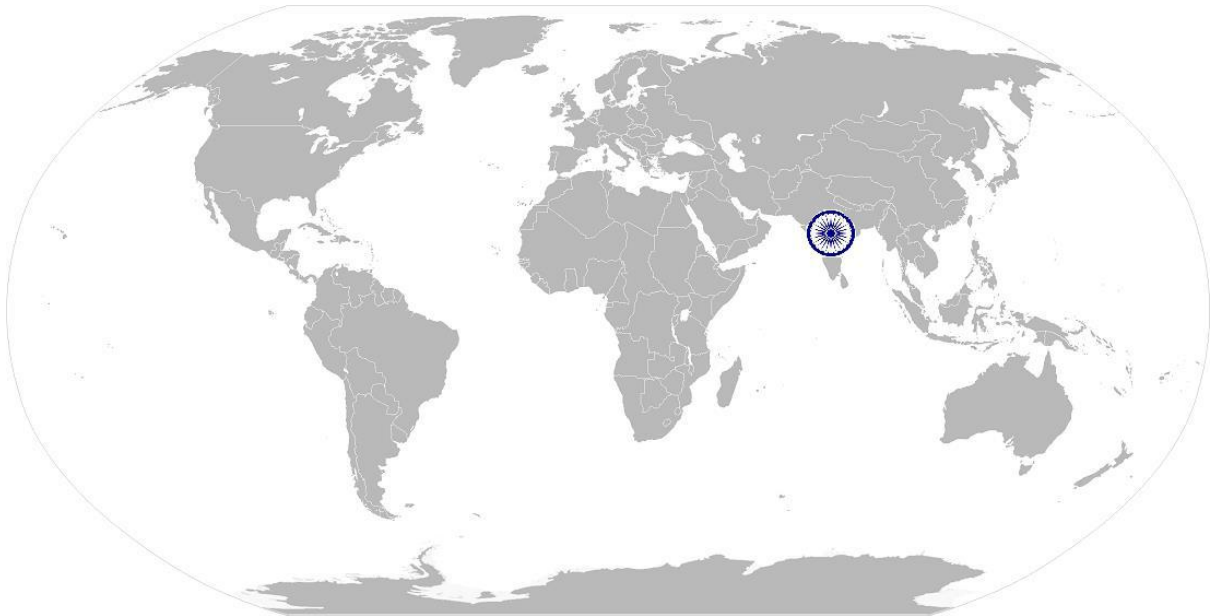
ASC/N3221 Conduct quality checks and inspection of the finished sand cast products

NOS Code	ASC/N3221		
Credits(NSQF)	TBD	Version number	1.0
Industry	Automotive	Drafted on	01. 07.2013
Industry Sub-sector	Manufacturing	Last reviewed on	20.07.2013
Occupation	Sand Casting	Next review date	Under revision expected date of revised version 31-dec -15



ASC/N0021Maintain 5S at the work premises

National Occupational Standards



Overview

This unit is about establishing a Safe, Healthy and Environment friendly workplace

ASC/N0021 Maintain 5S at the work premises

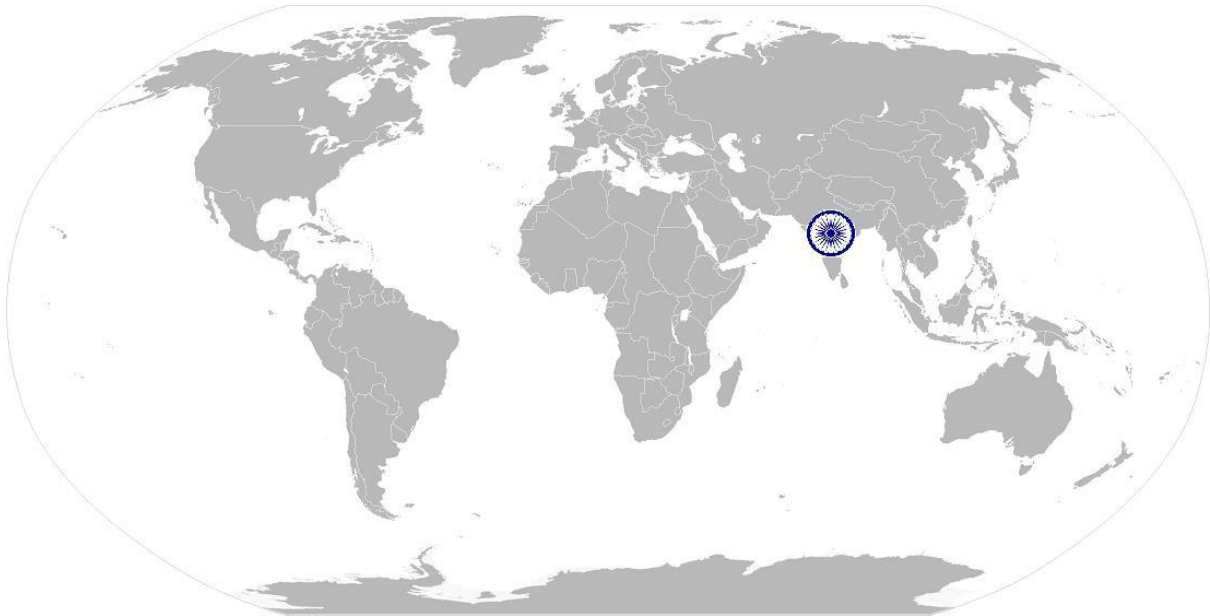
National Occupational Standard	Unit Code	ASC/N 0021
	Unit Title (Task)	Maintain 5S at the work premises
	Description	This NOS is about creating a Safe and Healthy work place, adhering to the safety guidelines in the working area, following practices which are not impacting the environment in a negative manner
	Scope	The role holder will be responsible for <ul style="list-style-type: none"> identifying and reporting of risks creating and sustaining a safe, clean and environment friendly work place This NOS will be applicable to all Automotive sector manufacturing job roles
	Performance Criteria (PC) w.r.t. the Scope	
	Element	Performance Criteria
	Identify and report the risks identified	<p>PC1. Identify activities which can cause potential injury through sharp objects, burns, fall, electricity, gas leakages, radiation, poisonous fumes, chemicals, loud noise</p> <p>PC2. Identify areas in the plant which are potentially hazardous/unhygienic in nature</p> <p>PC3. Conduct regular checks with support of the maintenance team on machine health to identify potential hazards due to wear and tear of machine</p> <p>PC4. Inform the concerned authorities about the potential risks identified in the processes, workplace area/ layout, materials used etc</p> <p>PC5. Inform the concerned authorities about machine breakdowns, damages which can potentially harm man/ machine during operations</p> <p>PC6. Create awareness amongst other by sharing information on the identified risks</p>
	Create and sustain a Safe, clean and environment friendly work place	<p>PC7. Support the Safety team and the supervisor in creating the risk mitigation plan</p> <p>PC8. Follow the instructions given on the equipment manual describing the operating process of the equipments</p> <p>PC9. Follow the Safety, Health and Environment related practices developed by the organization</p> <p>PC10. Ensure relevant safety boards/ signs are placed on the shop floor</p> <p>PC11. Operate the machine using the recommended Personal Protective Equipments (PPE) and ensure team members also use the related PPEs at the workplace</p> <p>PC12. Maintain a clean and safe working environment near the work place and ensure there is no spillage of chemicals, production waste, oil, solvents etc</p> <p>PC13. Attend all safety and fire drills to be self aware of safety hazards and preventive techniques</p>

ASC/N0021 Maintain 5S at the work premises

	<p>PC14. Maintain high standards of personal hygiene at the work place</p> <p>PC15. Ensure that the waste disposal is done in the designated area and manner as per organization SOP.</p> <p>PC16. Inform appropriately the medical officer/ HR in case of self or an employee's illness of contagious nature so that preventive actions can be planned for others</p>
Knowledge and Understanding (K)w.r.t. the scope	
Element	Knowledge and Understanding
A. Organizational Context (Knowledge of the company / organization and its processes)	<p>The user/individual on the job needs to know and understand:</p> <p>KA1. relevant standards, procedures and policies related to Health, Safety and Environment followed in the company</p> <p>KA2. emergency handling procedures & hierarchy for escalation</p>
B. Technical Knowledge	<p>The user/individual on the job needs to know and understand:</p> <p>KB1. basic knowledge of Safety procedures(fire fighting, first aid) within the organization</p> <p>KB2. basic knowledge of various types of PPEs and their usage</p> <p>KB3. basic knowledge of risks/hazards associated with each occupation in the organization</p> <p>KB4. knowledge of personal hygiene and how an individual can contribute towards creating a highly safe and clean working environment</p>
Skills (S)w.r.t. the scope	
Element	Skills
A. Core Skills/ Generic Skills	Writing Skills
	The user/ individual on the job needs to know and understand how to:
	SA1. write basic level notes and observations
	Reading Skills
	The user/individual on the job needs to know and understand how to:
SA2. read safety instructions put up across the plant premises	
SA3. read safety precautions mentioned in equipment manuals and panels to understand the potential risks associated	
Oral Communication (Listening and Speaking skills)	
The user/individual on the job needs to know and understand how to:	
SA4. effectively communicate information to team members	
SA5. Inform employees in the plant and concerned functions about events, incidents & potential risks observed related to Safety, Health and Environment.	
SA6. question operator/ supervisor in order to understand the safety related issues	
SA7. attentively listen with full attention and comprehend the information given by the speaker during safety drills and training programs	
B. Professional Skills	Judgmental Thinking

ASC/N0021Maintain 5S at the work premises

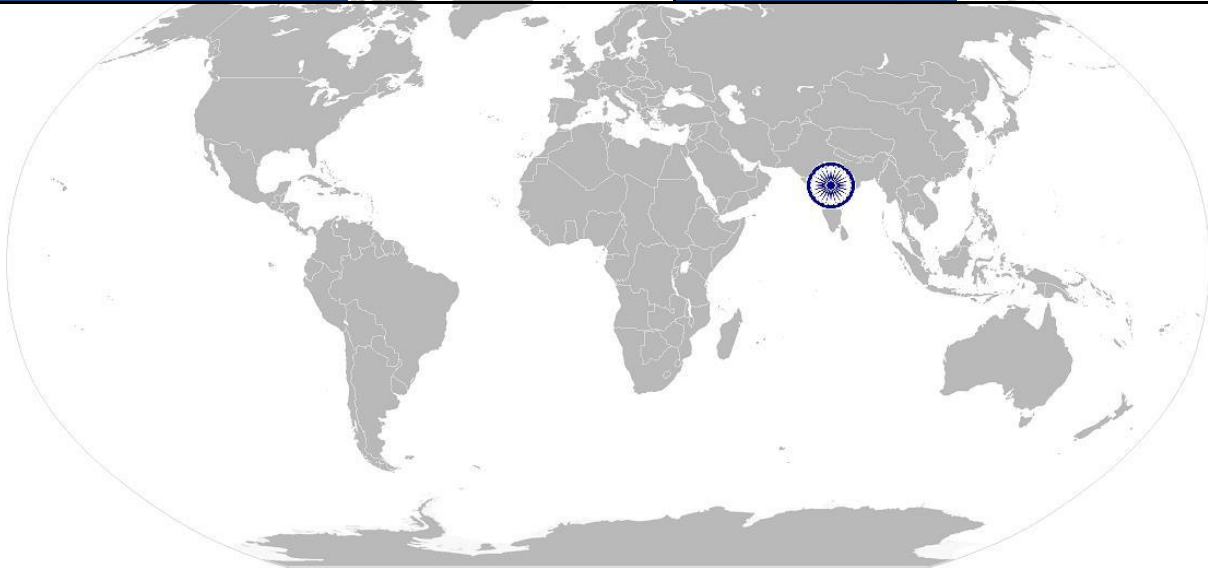
	<p>The user/individual on the job needs to know and understand how to:</p> <ul style="list-style-type: none">SB1. use common sense and make judgments during day to day basisSB2. use reasoning skills to identify and resolve basic problems
--	--



ASC/N0021 Maintain 5S at the work premises

NOS Version Control

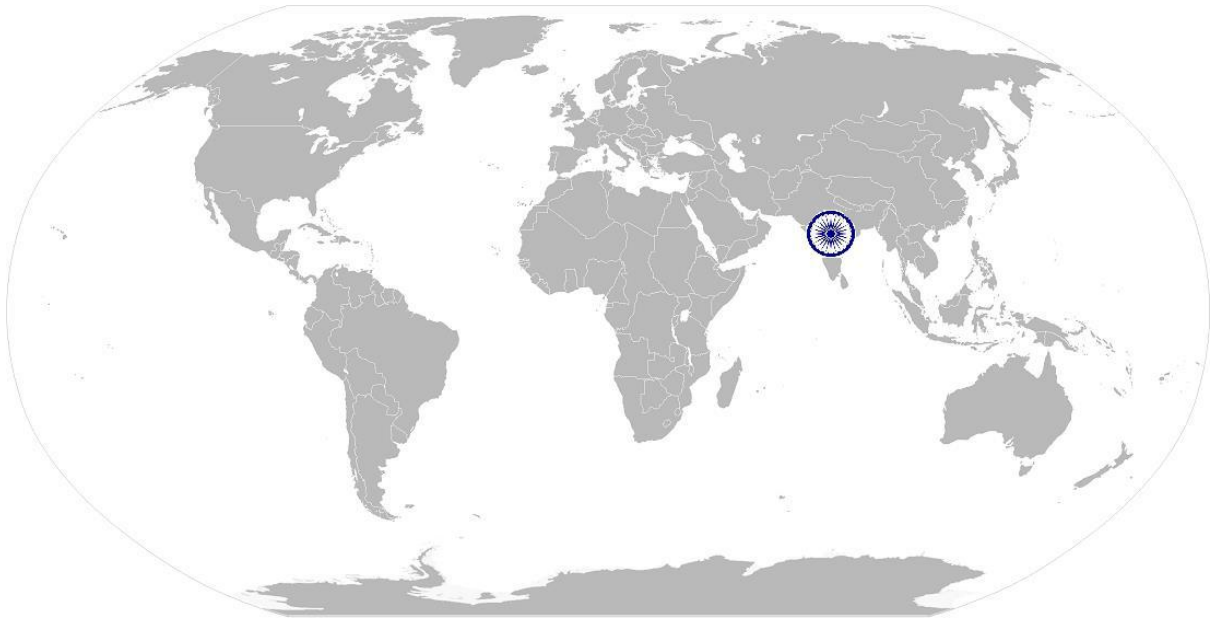
NOS Code	ASC/ N0021		
Credits(NSQF)	TBD	Version number	1.0
Industry	Automotive	Drafted on	15/8/2013
Industry Sub-sector	Manufacturing	Last reviewed on	30/08/2013
Occupation	Sand Casting	Next review date	Under revision expected date of revised version 31-dec -15



ASC/N0006

Maintain a safe and healthy working environment

National Occupational Standard



Overview

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

ASC/N0006

Maintain a safe and healthy working environment

National Occupational Standard

Unit Code	ASC/N 0006
Unit Title (Task)	Maintain a safe and healthy working environment
Description	This NOS is about ensuring all 5 S activities both at the shop floor and the office area to facilitate increase in work productivity
Scope	The individual needs to <ul style="list-style-type: none"> Ensure sorting, streamlining & organizing, storage and documentation, cleaning, standardization and sustenance across the plant and office premises of the organization
Performance Criteria (PC) w.r.t. the Scope	
Element	Performance Criteria
Ensure sorting	<p>PC1. Follow the sorting process and check that the tools, fixtures & jigs that are lying on workstations are the ones in use and unnecessary items are not cluttering the workbenches or work surfaces.</p> <p>PC2. Ensure segregation of waste in hazardous/ non Hazardous waste as per the sorting work instructions</p> <p>PC3. Follow the technique of waste disposal and waste storage in the proper bins as per SOP</p> <p>PC4. Segregate the items which are labeled as red tag items for the process area and keep them in the correct places</p> <p>PC5. Sort the tools/ equipment/ fasteners/ spare parts as per specifications/ utility into proper trays, cabinets, lockers as mentioned in the 5S guidelines/ work instructions</p> <p>PC6. Ensure that areas of material storage areas are not overflowing</p> <p>PC7. Properly stack the various types of boxes and containers as per the size/ utility to avoid any fall of items/ breakage and also enable easy sorting when required</p> <p>PC8. Return the extra material and tools to the designated sections and make sure that no additional material/ tool is lying near the work area</p> <p>PC9. Follow the floor markings/ area markings used for demarcating the various sections in the plant as per the prescribed instructions and standards</p>
Ensure proper documentation and storage (organizing, streamlining)	<p>PC10. Follow the proper labeling mechanism of instruments/ boxes/ containers and maintaining reference files/ documents with the codes and the lists</p> <p>PC11. Check that the items in the respective areas have been identified as broken or damaged</p> <p>PC12. Follow the given instructions and check for labeling of fluids, oils, lubricants, solvents, chemicals etc. and proper storage of the same to avoid spillage, leakage, fire etc.</p> <p>PC13. Make sure that all material and tools are stored in the designated places and in the manner indicated in the 5S instructions</p>

ASC/N0006

Maintain a safe and healthy working environment

<p>Ensure cleaning of self and the work place</p>	<p>PC14. Check whether safety glasses are clean and in good condition PC15. Keep all outside surfaces of recycling containers are clean PC16. Ensure that the area has floors swept, machinery clean and generally clean. In case of cleaning, ensure that proper displays are maintained on the floor which indicate potential safety hazards PC17. Check whether all hoses, cabling & wires are clean, in good condition and clamped to avoid any mishap or mix up PC18. Ensure workbenches and work surfaces are clean and in good condition PC19. Follow the cleaning schedule for the lighting system to ensure proper illumination PC20. Store the cleaning material and equipment in the correct location and in good condition PC21. Ensure self-cleanliness - clean uniform, clean shoes, clean gloves, clean helmets, personal hygiene</p>
<p>Ensure sustenance</p>	<p>PC1. Follow the daily cleaning standards and schedules to create a clean working environment PC2. Attend all training programs for employees on 5 S PC3. Support the team during the audit of 5 S PC4. Participate actively in employee work groups on 5S and encourage team members for active participation PC5. Follow the guidelines for What to do and What not to do to build sustainability in 5S as mentioned in the 5S check lists/ work instructions</p>
<p>Knowledge and Understanding (K) w.r.t. the scope</p>	
<p>Element</p>	<p>Knowledge and Understanding</p>
<p>A. Organizational Context (Knowledge of the company / organization and its processes)</p>	<p>The user/individual on the job needs to know and understand: KA3. relevant standards, procedures and policies related to 5S followed in the company</p>
<p>B. Technical Knowledge</p>	<p>The user/individual on the job needs to :</p> <p>KB5. have basic knowledge of 5S procedures KB6. know various types 5s practices followed in various areas KB7. understand the 5S checklists provided in the department/ team KB8. have skills to identify useful & non useful items KB9. have knowledge of labels , signs & colours used as indicators KB10. Have knowledge on how to sort and store various types of tools, equipment, material etc. KB11. know , how to identify various types of waste products KB12. understand the impact of waste/ dirt/ dust/unwanted substances on the process/ environment/ machinery/ human body KB13. have knowledge of best ways of cleaning & waste disposal KB14. understand the importance of standardization in processes</p>

ASC/N0006

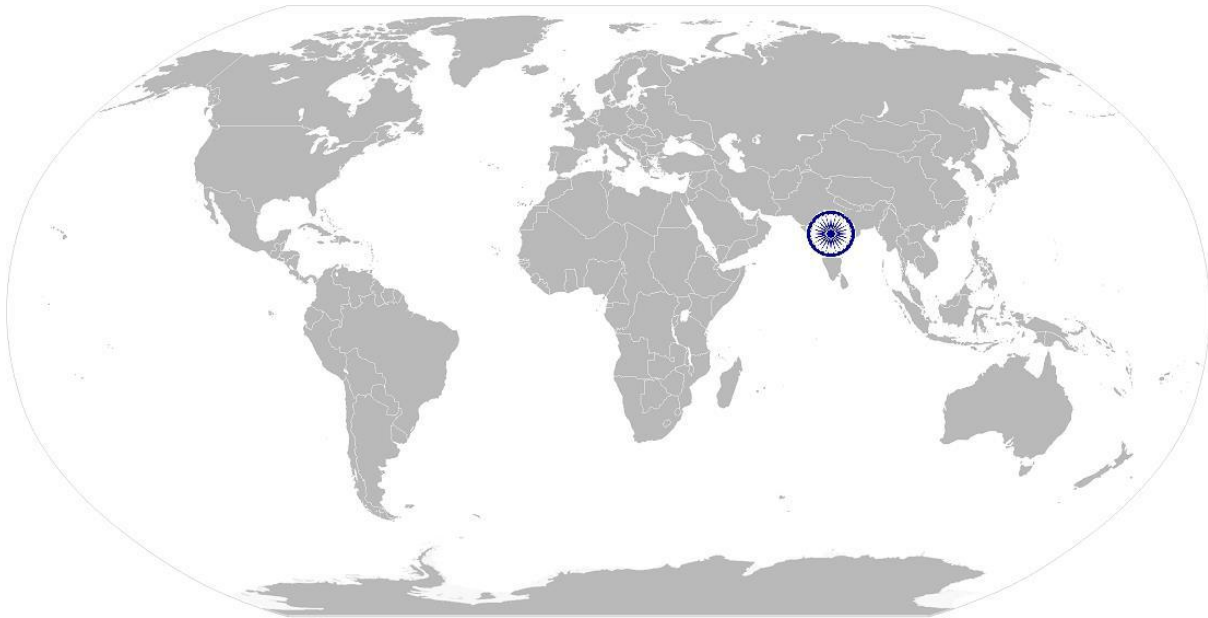
Maintain a safe and healthy working environment

	KB15. understand the importance of sustainability in 5S KB16. have knowledge of TQM process KB17. have knowledge of various materials and storage norms KB18. understand visual controls, symbols, graphs etc.
Skills (S)w.r.t. the scope	
Element	Skills
A. Core Skills/ Generic Skills	Writing Skills
	The user/ individual on the job needs to know and understand how to: SA8. write basic level notes and observations SA9. note down observations (if any) related to the process SA10. write information documents to internal departments/ internal teams
	Reading Skills
	The user/individual on the job needs to know and understand how to: SA11. read 5S instructions put up across the plant premises
	Oral Communication (Listening and Speaking skills)
	The user/individual on the job needs to know and understand how to: SA12. effectively communicate information to team members inform employees in the plant and concerned functions about 5S SA13. question the process head in order to understand the 5S related issues SA14. attentively listen with full attention and comprehend the information given by the speaker during 5S training programs
B. Professional Skills	Judgmental Thinking
	The user/individual on the job needs to know and understand how to: SB3. use common sense and make judgments during day to day basis SB4. use reasoning skills to identify and resolve basic problems using 5S
	Persuasion
	The user/ individual on the jobs needs to know and understand how to: SB5. persuade co team members to follow 5 S SB6. ensure that the co team members understand the importance of using 5 S tool
	Creativity
The user/individual on the job needs to know and understand how to : SB7. use innovative skills to perform and manage 5 S activities at the work desk and the shop floor SB8. exhibit inquisitive behaviour to seek feedback and question on the existing set patterns of work	
	Self –Discipline

ASC/N0006

Maintain a safe and healthy working environment

	<p>The user/individual on the job needs to know and understand how to:</p> <ul style="list-style-type: none">SB9. do what is right, not what is a popular practicesSB10. follow shop floor rules& regulations and avoid deviations; make 5S an integral way of lifeSB11. ensure self-cleanliness on a daily basisSB12. demonstrate the will to keep the work area in a clean and orderly manner
--	--

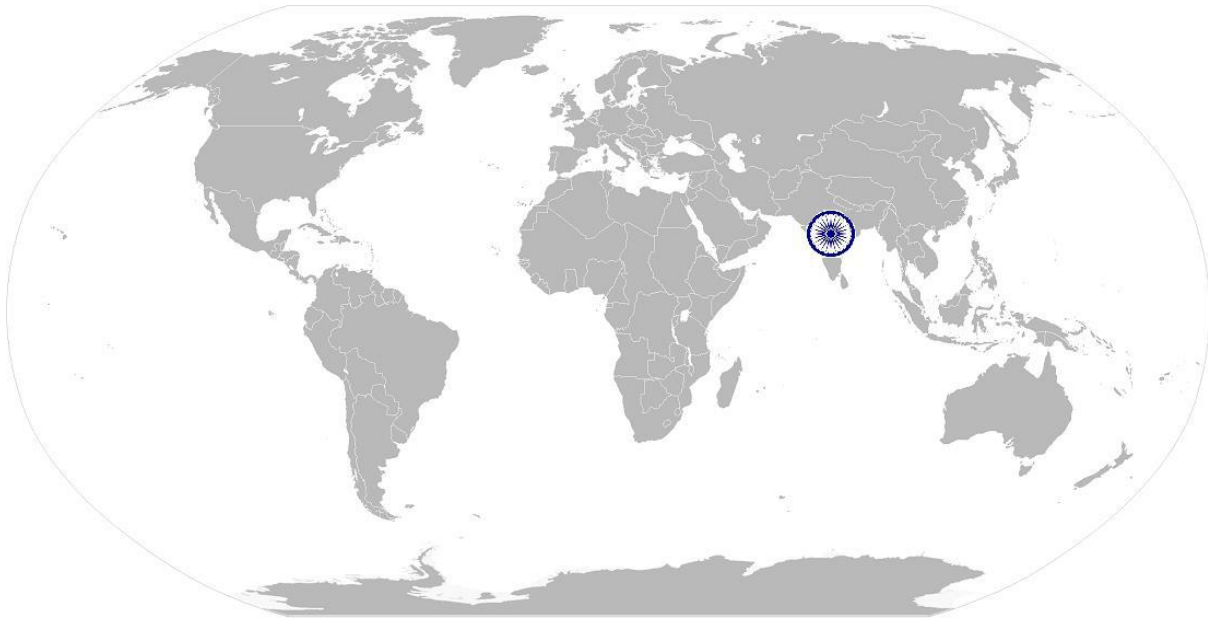


ASC/N0006

Maintain a safe and healthy working environment

NOS Version Control

NOS Code	ASC/N0006		
Credits(NSQF)	TBD	Version number	1.0
Industry	Automotive	Drafted on	1/03/2014
Industry Sub-sector	Manufacturing/ R&D	Last reviewed on	15/03/2014
Occupation	Sand Casting	Next review date	15/03/2016



Qualification Pack for Casting Technician – Sand Moulding

Annexure

Nomenclature for QP and NOS

Qualifications Pack

9 characters

[ABC]/ Q 0101

[Insert 3 letter codes for SSC]

Q denoting Qualifications Pack



QP number (2 numbers)

Occupation (2 numbers)

Occupational Standard

An example of NOS with 'N'

9 characters

[ABC] / N 0101

[Insert 3 letter codes for SSC]

N denoting National Occupational Standard



OS number (2 numbers)

Occupation (2 numbers)

Qualification Pack for Casting Technician – Sand Moulding

The following acronyms/ codes have been used in the nomenclature above:

Sub-sector	Range of Occupation numbers
Manufacturing	31 - 45 & 61 - 68
Research & Development	81 - 84
Sales & Service	01 - 21
Road Transportation	96 - 97

Sequence	Description	Example
Three letters	Automotive	ASC
Slash	/	/
Next letter	Whether QP or NOS	N
Next two numbers	Occupation code	01
Next two numbers	OS number	01

Qualification Pack for Casting Technician – Sand Moulding

CRITERIA FOR ASSESSMENT OF TRAINEES

Job Role: Casting Technician- Sand Moulding

Qualification Pack: ASC/Q3205

Sector Skill Council: Automotive Skills Development Council

Guidelines for Assessment

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 proportion of marks for Theory and Skills Practical for each 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).
4. Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/training center based on this criterion.
5. To pass the Qualification Pack, every trainee should score a minimum of 70% of aggregate marks to successfully clear the assessment.
6. In case of *unsuccessful completion*, the trainee may seek reassessment on the Qualification Pack.

NOS Title/ NOS Elements	NOS & Performance Criterion Description	Marks allocation		
		Theory	Viva	Practical
ASC/N3214	Understand and interpret engineering drawings and sketches related to casting			
Identify the right drawing to be used for the process	PC1. Check the version of the engineering drawing provided. PC2. Select the latest version of the available engineering drawing so that the final measurements and design is available with the team		20	--
Understand the engineering drawings, sketches and work order and identify required work steps	PC3. Thoroughly understand the work order (work output) required from the process PC4. Clearly understanding the does and don'ts of the manufacturing process as defined in SOPs/ Work Instructions or defined by supervisors PC5. Refer all engineering drawings and sketches related to the work output to understand the measurement dimensions and shape of the required work output		10	10

Qualification Pack for Casting Technician – Sand Moulding

	<p>PC6. Identify the required activities which need to be executed in order achieve the final output as per the work order</p> <p>PC7. Ensure that the process adopted is according to the Work Instructions/ Standard Operating Procedures adopted</p>			
Documentation and storage of the drawings/ sketches	<p>PC8. Store the drawings in a proper place where they cannot be damaged by moisture, chemicals, fire and can be easily accessed by the user</p> <p>PC9. Observe any modification, changes required in the drawing and communicate the same to the concerned team in the organization</p>		10	10
	subtotal		40	20
ASC/N 3215	Understand Casting and sand moulding processes and equipment requirement to complete the task	Theory	Viva	Practical
Determine the type of sand, core and mould requirement	<p>PC1. Understand the specifications and dimensions of output and determine the type of sand to be used to prepare core and mould</p> <p>PC2. Understand the specifications and dimensions of output and determine the dimensions of core and mould</p>		10	10
Determine the sand casting requirements, equipment and parameters	<p>PC3. Determine the Casting methodology and process to be adopted for completing the work order</p> <p>PC4. Determine the various casting parameters like temperature, pouring speed etc. before starting the process</p> <p>PC5. Determine the equipment availability for executing the activity</p>		10	20
Escalations of queries on the given job	<p>PC6. Refer the queries to a competent internal specialist if they cannot be resolved by the operator on own</p> <p>PC7. Obtain help or advice from specialist if the problem is outside his/her area of competence or experience</p> <p>PC8. Confirm self -understanding to the specialist once the query is resolved so that all doubts & queries can be resolved before the actual process</p>		10	--

Qualification Pack for Casting Technician – Sand Moulding

	execution			
	subtotal		30	30
ASC/N 3216	Prepare the machine (apparatus) and auxiliaries	Theory	Viva	Practical
Determine the process requirements, tools, equipment and parameters to be used for sand making, core making, mould making and sand casting	PC1. Determine the type of sand and apparatus to be used for making the same to produce desired moulds PC2. Determine the right methodology to prepare cores and moulds and various parameters like temperature, geometric dimensions etc. PC3. Determine the right casting and trimming methodology and process to be adopted for completing the work order PC4. Correctly determine the various casting and trimming parameters like temperature, geometric dimensions etc. before starting the process PC5. Determine the material required and the equipment availability for executing the activity		15	40
Clean the dies and equipment & tools before executing the sand making, core making, mould making and casting process and setup the equipment	PC6. Ensure cleaning of machinery like mixers, hoppers, feeders etc by spraying or brushing surfaces with parting agents to ensure smoothness and prevent sticking or seepage PC7. Ensure cleaning of the other machine and tools, auxiliaries (spatulas, chippers etc.) before the initiation of the process PC8. Setup the respective apparatus as per the selected sand making/ core making/ mould making/ Casting process and the standards used in the automobile industry		10	20
Prepare sand, core, mould and output as per the product specification	PC9. Correctly analyze the geometric specifications for the output and ensure the core, mould and output are in line with product drawing/ sketches available PC10. In case the output is not as per the given measurements, remove extra material by using chippers, grinders etc.		10	25

Qualification Pack for Casting Technician – Sand Moulding

Escalations of queries for the given job	<p>PC11. Immediately refer the queries to a competent internal specialist if they cannot be resolved by the operator on own</p> <p>PC12. Obtain help or advice from specialist if the problem is outside his/her area of competence or experience</p> <p>PC13. Confirm self -understanding to the specialist once the query is resolved so that all doubts & queries can be resolved before the actual process execution</p>		5	15
	Subtotal		40	100
ASC/N 3217	Perform the sand making related operations and monitor process parameters	Theory	Viva	Practical
Check the operations of the equipment used in the sand making	<p>PC1. Check for operation of apparatus for sand feeding and mixing like hoppers, mixers etc. as per the instructions mentioned in the Work Instructions/ SOPs</p> <p>PC2. Make modifications in the machine parameters if required and ensure alignment with the prescribed standards</p>		10	20
Pour the sand into mixer	<p>PC3. Instruct assistant operator to turn valves of machines to regulate speed and quantity of the sand</p> <p>PC4. Ensure pouring in line with the defined standards and specifications</p>		10	30
Prepare the sand in line with the defined standards	<p>PC5. Feed the mixer with the required additives in the right quantities. The quantity of additives added in the sand should be as per the process requirements mentioned in the Work Instructions/ SOPs</p> <p>PC6. Feed the required operation code in the mixer</p> <p>PC7. Clean and lubricate the machinery to prevent any sand sticking on the mixer/ hopper surface</p>		20	30
Check measurement instruments for monitoring process parameters	PC8. Monitor the sand feeding and mixing process by observing and analyzing the readings on various panels/ meters to prevent machine breakdown/ Process stoppage and		10	20

Qualification Pack for Casting Technician – Sand Moulding

	<p>deviations of the cast from desired specifications</p> <p>PC9. Observe and analyze any irregularity in the process and take preventive steps</p>			
Perform the inspection of the sand	<p>PC10. Perform the quality check on output sand in terms of grain compressive strength etc.</p> <p>PC11. In case there are any inconsistencies identified in the properties of the output sand, send the same for further processing</p>		10	20
	Sub total		60	120
ASC/N 3218	Perform the core making related operations and monitor process parameters	Theory	Viva	Practical
Check the operations of the equipment used in preparing the core	<p>PC1. Check for operation of core making apparatus like hoppers, pouring nozzles, mixers, pressing machines etc.</p> <p>PC2. Make modifications in the machine related parameters if required and ensure alignment with the prescribed standards</p>		10	30
Pour the sand and additives required into die	<p>PC3. Turn valves (like butterfly valve) of machines to regulate flow of additives and sand into the die</p> <p>PC4. Ensure pouring in line with the defined standards and specifications</p>		10	10
Conduct the actual core making process	<p>PC5. Ensure that the right type of die is put in the machine.</p> <p>PC6. Ensure escalation of any issues related to die setting to the machine setter in the plant</p> <p>PC7. Feed the required operation code in the pressing machine for it to prepare the core</p> <p>PC8. Adjust the temperature, pressure and other parameters as per the core's requirement</p> <p>PC9. Monitor the process parameters and ensure that the cycle time of the process is as per the Work Instructions/ SOPs</p> <p>PC10. Ensure proper hardening of the core by creating hot vapor within the core making process</p>		10	30

Qualification Pack for Casting Technician – Sand Moulding

	<p>PC11. Withdraw the output core carefully from the machine at the end of the core making cycle time</p> <p>PC12. Turn valves to circulate high pressure air to clean the die</p> <p>PC13. Blow air jet on core to remove impurities or additional material stuck in between die/ machine parts which can hamper future casting operations</p>			
Perform painting of the core	<p>PC14. Instruct helper to prepare the water based paint for core</p> <p>PC15. Check the viscosity and other properties of paint</p> <p>PC16. Dip the core into paint tank and remove the same once coated with paint</p> <p>PC17. Put the painted core into heater/ combustion zone for hardening</p>		10	20
Remove surface imperfections using Shot Blasting technique	<p>PC18. Clean the shot blasting machine using Air pressure blast to remove any dust particles and any unwanted material</p> <p>PC19. Load the components and the shots in the chamber of the shot blasting machine</p> <p>PC20. Ensure that the door of the shot blasting machine is tightly closed</p> <p>PC21. Switch ON the Shot Blasting machine and ensure that all auxiliary motors are in the ON position</p> <p>PC22. Keep the machine in the moving position till the cycle time prescribed in the Work Instructions/ SOP manual</p> <p>PC23. Switch OFF the machine and inspect the parts. Turn the parts into the opposite side. Ensure that all the parts in the current position are completely turned in the opposite direction</p> <p>PC24. Keep the machine moving till the prescribed cycle time is achieved. Ensure that the cycle time get completed for both the cycles.</p> <p>PC25. Open the Shot Blasting machine and carefully remove the components from the machine and load them</p>		20	40

Qualification Pack for Casting Technician – Sand Moulding

	into the designated trolley PC26. Ensure that the machine is again cleaned using an Air Blasting machine			
Check measurement instruments for monitoring process parameters	PC27. Monitor the core making process (right from sand feeding till core hardening) by observing and analyzing the readings on various panels/ meters to prevent machine breakdown and deviations of the output core from desired specifications PC28. Observe and analyze any irregularity in the process and take preventive steps		5	10
Perform the visual inspection of the output to further finish the core	PC29. Measure the final core and compare the dimensions as prescribed in the work order engineering drawing PC30. In case the core is not as per the given measurements, send the same for further processing		5	10
	subtotal		80	170
ASC/N 3219	Perform the mould making related operations and monitor process parameters	Theory	Viva	Practical
Check the operations of the equipment used in preparing the mould	PC1. Check for operation of mould making apparatus like hoppers, pouring nozzles, mixers, pressing machines etc. PC2. Make modifications in the machine related parameters if required and ensure alignment with the prescribed standards		10	20
Pour the sand and additives required into die	PC3. Turn valves (like butterfly valve) of machines to regulate flow of additives and sand into the die PC4. Ensure pouring in line with the defined standards and specifications		10	20
Conduct the actual mould making process	PC5. Ensure that the right type of die is put in the machine. PC6. Ensure escalation of any issues related to die setting to the machine setter in the plant PC7. Check the mould making machine as per the checklist provided at the			

Qualification Pack for Casting Technician – Sand Moulding

	<p>working place</p> <p>PC8. Adjust the temperature, pressure and other parameters as per the output mould requirement</p> <p>PC9. Feed the required operation code in the pressing machine for it to prepare the mould</p> <p>PC10. Withdraw the output mould carefully from the machine</p> <p>PC11. Prepare the mould box (combination of core and mould with a metal jacket on it) for casting of metal</p> <p>PC12. Ensure that the two halves of the mould box do not move while pouring operations of the molten metal are in process</p> <p>PC13. Turn valves to circulate jet to clean the die</p> <p>PC14. Blow air jet on mould to remove impurities or additional material between the cavities</p>		20	40
Check measurement instruments for monitoring process parameters	<p>PC15. Monitor the mould making process (right from sand feeding till mould preparation) by observing and analyzing the readings on various panels/ meters to prevent machine breakdown and deviations of the output mould pattern from desired specifications</p> <p>PC16. Observe and analyze any irregularity in the process and take preventive steps</p>		10	20
Perform the visual inspection of the output to further finish the mould	<p>PC17. Measure the final mould pattern and compare the dimensions as prescribed in the work order engineering drawing</p> <p>PC18. In case the mould is not as per the given measurements, send the same for further processing</p>		--	20
	subtotal		50	120
ASC/N 3220	Perform the sand casting related operations and monitor process parameters	Theory	Viva	Practical
Check the operations of the equipment used in the sandcasting process	<p>PC1. Check for operation of casting apparatus like Molten metal carrying bucket, pouring nozzles, ladles etc.</p>		10	20

Qualification Pack for Casting Technician – Sand Moulding

	<p>PC2. Ensure casting parameters are as per the batch specifications laid down by the laboratory team</p> <p>PC3. Make modifications in the casting parameters if required and ensure alignment with the prescribed standards</p>			
Pour the metal into mould	<p>PC4. Turn valves of machines to regulate speed of the metal into moulds through runners</p> <p>PC5. Ensure pouring in line with the defined work standards and specifications and minimization of metal spillage in the work area; Record the pouring observations like parting leak, gas evolution, interrupted pouring or any abnormality</p> <p>PC6. Maintain downsprue always full during pouring as per the process mentioned in the work instructions/ SOPs</p> <p>PC7. Ensure metal stream inoculation per each mould</p>		10	30
Conduct the actual sandcasting process	<p>PC8. Turn valves to circulate water through cores, or spray water on filled molds to cool and solidify metal (in case of manual solidification)</p> <p>PC9. Remove the sand moulds with metal casted in the desired shape</p> <p>PC10. Clean and lubricate metal casts and machinery as specified in the Work Instructions/ SOPs</p> <p>PC11. Stamp the cast with the identifying information (wherever required) and send the same for further processing</p>		10	30
Check measurement instruments for monitoring casting process parameters	<p>PC12. Monitor the casting process (parameters like temperature etc.) by observing and analyzing the readings on various panels/ meters to prevent machine breakdown and deviations of the cast from desired specifications</p> <p>PC13. Observe and analyze any irregularity in the process and take preventive steps</p>		10	20

Qualification Pack for Casting Technician – Sand Moulding

	PC14. Check the in line composition/ soundness of the casting			
Perform Post casting operations	PC15. Pull out the entire mould with solidified metal from the machine PC16. Hammer out the sand to obtain metal casting after a lapse of definite time PC17. Use wedge cutting machines to separate the cast runner from the prepared casts PC18. Perform cleaning of the metal casting through air/ water jet		10	20
Perform the visual inspection of the output to further finish the casting	PC19. Measure the final metal casting and compare the dimensions as prescribed in the work order engineering drawing PC20. In case the parts are not as per the given measurements, send the same for further processing in terms of chipping, fettling, wedge cutting etc.		10	10
Remove surface imperfections using Shot Blasting technique	PC21. Clean the shot blasting machine using Air pressure blast to remove any dust particles and any unwanted material PC22. Load the components and the shots in the chamber of the shot blasting machine PC23. Ensure that the door of the shot blasting machine is tightly closed PC24. Switch ON the Shot Blasting machine and ensure that all auxiliary motors are in the ON position PC25. Keep the machine in the moving position till the cycle time prescribed in the Work Instructions/ SOP manual PC26. Switch OFF the machine and inspect the parts. Turn the parts into the opposite side. Ensure that all the parts in the current position are completely turned in the opposite direction PC27. Keep the machine moving till the prescribed cycle time is achieved. Ensure that the cycle time get completed for both the cycles. PC28. Open the Shot Blasting machine		20	40

Qualification Pack for Casting Technician – Sand Moulding

	<p>and carefully remove the components from the machine and load them into the designated trolley</p> <p>PC29. Ensure that the machine is again cleaned using an Air Blasting machine</p>			
	subtotal		80	170
ASC/N 3221	Conduct quality checks and inspection of the finished sand cast products	Theory	Viva	Practical
Inspection of finished goods to detect any deviations from the product design	<p>PC1. Measure the specifications of the finished product using devices like micrometer, Vernier calipers, gauges, rulers, weighing scales and any other inspection equipment and compare with the parameters given in the work order</p> <p>PC2. Compare texture, color, surface properties, hardness and strength with the given product specifications</p>		5	10
Record log of defective products and discard defective pieces	<p>PC3. Note down the observations of the basic inspection process and identify pieces which are OK and also not meeting the specified standards</p> <p>PC4. Separate the defective pieces into two categories – pieces which can be repaired/ modified and pieces which are beyond repair</p> <p>PC5. Discard the pieces which are beyond repair and repair the ones which need minor modifications/ rework</p> <p>PC6. Maintain records of each category of work outputs</p> <p>PC7. Establish linkage between rejection of output and the pertinent causes for the same (process/ material etc.); Recommend the means for rejection control</p>		10	10
Repair the pieces with minor defects	<p>PC8. Rectify minor defects like excess slag, shape deformation, sharp edges, rough surfaces, grooves, holes etc. by Fettling, chipping, cutting, sawing, filling, shearing, hammering etc.</p> <p>PC9. Escalate all issues related to change in colour, surface properties, hardness etc. so that the manufacturing equipment can be</p>		10	10

Qualification Pack for Casting Technician – Sand Moulding

	reset to achieve the specified output			
Perform Batch Quality Procedure	PC10. Provide first and last casting from each batch to the lab for quality check on its composition, soundness, nodularity etc. PC11. Obtain batch clearance from the lab		5	10
	subtotal		30	40
ASC/N 0021	Maintain 5S at the work premises	Theory	Viva	Practical
Identify and report the risks identified	PC1. Identify activities which can cause potential injury through sharp objects, burns, fall, electricity, gas leakages, radiation, poisonous fumes, chemicals ,loud noise PC2. Identify areas in the plant which are potentially hazardous/ unhygienic in nature PC3. Conduct regular checks on machine health to identify potential hazards due to wear and tear of machine PC4. Inform the concerned authorities about the potential risks identified in the processes, workplace area/ layout, materials used etc. PC5. Inform the concerned authorities about machine breakdowns, damages which can potentially harm man/ machine during operations PC6. Create awareness amongst other by sharing information on the identified risks		40	-
Create and sustain a Safe, clean and environment friendly work place	PC7. Support the Safety team and the supervisor in creating the risk mitigation plan PC8. Follow the instructions given on the equipment manual describing the operating process of the equipment PC9. Follow the Safety, Health and Environment related practices developed by the organization PC10. Operate the machine using the recommended Personal Protective Equipment (PPE) and ensure team members also use the related PPEs at the workplace PC11. Maintain a clean and safe working		30	80

Qualification Pack for Casting Technician – Sand Moulding

	<p>environment near the work place and ensure there is no spillage of chemicals, production waste, oil, solvents etc</p> <p>PC12. Attend all safety and fire drills to be self aware of safety hazards and preventive techniques</p> <p>PC13. Maintain high standards of personal hygiene at the work place</p> <p>PC14. Ensure that the waste disposal is done in the designated area and manner as per organization SOP.</p> <p>PC15. Inform the medical officer/ HR in case of self or an employee's illness of contagious nature so that preventive actions can be planned for others</p>			
	Sub total		70	80
ASC/N 0006	Maintain a safe and healthy working environment		Viva	practical
Ensure sorting	<p>PC1. Follow the sorting process and check that the tools, fixtures & jigs that are lying on workstations are the ones in use and un-necessary items are not cluttering the workbenches or work surfaces.</p> <p>PC2. Ensure segregation of waste in hazardous/ non Hazardous waste as per the sorting work instructions</p> <p>PC3. Follow the technique of waste disposal and waste storage in the proper bins as per SOP</p> <p>PC4. Segregate the items which are labeled as red tag items for the process area and keep them in the correct places</p> <p>PC5. Sort the tools/ equipment/ fasteners/ spare parts as per specifications/ utility into proper trays, cabinets, lockers as mentioned in the 5S guidelines/ work instructions</p> <p>PC6. Ensure that areas of material storage areas are not overflowing</p> <p>PC7. Properly stack the various types of boxes and containers as per the size/ utility to avoid any fall of items/ breakage and also enable easy sorting</p>		10	20
			10	20

Qualification Pack for Casting Technician – Sand Moulding

	<p>when required</p> <p>PC8. Return the extra material and tools to the designated sections and make sure that no additional material/ tool is lying near the work area</p> <p>PC9. Follow the floor markings/ area markings used for demarcating the various sections in the plant as per the prescribed instructions and standards</p>			
<p>Ensure proper documentation and storage (organizing , streamlining)</p>	<p>PC10. Follow the proper labeling mechanism of instruments/ boxes/ containers and maintaining reference files/ documents with the codes and the lists</p> <p>PC11. Check that the items in the respective areas have been identified as broken or damaged</p> <p>PC12. Follow the given instructions and check for labeling of fluids, oils. lubricants, solvents, chemicals etc. and proper storage of the same to avoid spillage, leakage, fire etc.</p> <p>PC13. Make sure that all material and tools are stored in the designated places and in the manner indicated in the 5S instructions</p>		10	20
<p>Ensure cleaning of self and the work place</p>	<p>PC14. Check whether safety glasses are clean and in good condition</p> <p>PC15. Keep all outside surfaces of recycling containers are clean</p> <p>PC16. Ensure that the area has floors swept, machinery clean and generally clean. In case of cleaning, ensure that proper displays are maintained on the floor which indicate potential safety hazards</p> <p>PC17. Check whether all hoses, cabling & wires are clean, in good condition and clamped to avoid any mishap or mix up</p> <p>PC18. Ensure workbenches and work surfaces are clean and in good condition</p> <p>PC19. Follow the cleaning schedule for the lighting system to ensure proper illumination</p> <p>PC20. Store the cleaning material and equipment in the correct location and</p>		10	40

Qualification Pack for Casting Technician – Sand Moulding

	in good condition PC21. Ensure self-cleanliness - clean uniform, clean shoes, clean gloves, clean helmets, personal hygiene			
Ensure sustenance	PC22. Follow the daily cleaning standards and schedules to create a clean working environment PC23. Attend all training programs for employees on 5 S PC24. Support the team during the audit of 5 S PC25. Participate actively in employee work groups on 5S and encourage team members for active participation PC26. Follow the guidelines for What to do and What not to do to build sustainability in 5S as mentioned in the 5S check lists/ work instructions		10	20
	Sub total		50	120
	Total	320	530	970