

Model Curriculum

Casting Line Incharge

SECTOR: AUTOMOTIVE
SUB-SECTOR: MANUFACTURING
OCCUPATION: CASTING
REF ID: ASC/Q 3207 V1.0
NSQF LEVEL: 6



Certificate

**CURRICULUM COMPLIANCE TO
QUALIFICATION PACK - NATIONAL OCCUPATIONAL
STANDARDS**

is hereby issued by the

AUTOMOTIVE SKILLS DEVELOPMENT COUNCIL

for

MODEL CURRICULUM

Complying to National Occupational Standards of
Job Role/Qualification Pack "Casting Line Incharge" QP No: "ASC/Q3207, NSQF Level 6"

Date of Issuance: August 12th, 2018

Valid up to: July 12th, 2020*

*Valid up to the next review date of the Qualification Pack


Authorised Signatory
(Automotive Skills Development Council)

TABLE OF CONTENTS

1. Curriculum	01
2. Trainer Prerequisites	07
3. Annexure: Assessment Criteria	08

This course encompasses 6 out of 6 National Occupational Standards (NOS) of “Casting Line Incharge” Qualification Pack issued by “Automotive Skills Development Council”.

Sr. No.	Module	Key Learning Outcomes	Equipment Required
1	<p>Introduction</p> <p>Theory Duration (hh:mm) 05:00</p> <p>Practical Duration (hh:mm) 00:00</p> <p>Corresponding NOS Code Bridge module</p>	<ul style="list-style-type: none"> List general discipline rules in the class room Discuss about automotive industry List various auto manufacturers Discuss terms associated with the sector List job opportunities as casting line incharge Outline career growth path for a casting line incharge 	Computer and projector
2	<p>Manage end to end process related to metal casting process</p> <p>Theory Duration (hh:mm) 30:00</p> <p>Practical Duration (hh:mm) 55:00</p> <p>Corresponding NOS Code ASC/N3223</p>	<ul style="list-style-type: none"> Interpret information from sketches and engineering drawings. Know basic principles of engineering drawing. Identify different types of cleaning techniques, casting processes and associated equipment. Explain pressure die casting and gravity die casting. Identify and use different types of tools and machinery required for casting. Follow key steps for casting and trimming. Identify different raw materials, metals & alloys and consumables used in the melt shop. Identify impact of various physical parameters on the properties of final output product. Apply different type of automated processes pertinent to casting. Perform setup of respective apparatus of sand making/ core making/mould making/ Casting process. Perform monitoring of sand feeding and mixing process. Demonstrate use of measuring instruments vernier callipers, micrometers and other measurement systems. Identify quality defects in work pieces. Learn mechanical laws and working of casting machines. Follow safety precautions to be taken for all types of activities. 	<p>PPT's and teaching aids</p> <p>Raw Materials: Sand, die</p> <p>Machinery: hoppers, pouring nozzles, mixers, pressing machines, feeders etc.</p> <p>Auxiliaries: bucket, pouring nozzles, ladles, spatulas, chippers etc.</p> <p>Shot blasting machine</p> <p>Fuel: Charcoal</p> <p>Measuring Tools: Steel tape, steel rule, vernier calliper, micrometer, compass</p> <p>Cutting Tools: Hacksaw frame adjustable, chisel, scissor, Sand paper</p> <p>Driving Tools: Chipping hammer, wooden mallet,</p> <p>Safety Materials: Fire extinguisher, Leather safety gloves, leather aprons, safety glasses, Ear Plug, Safety Shoe and First aid kit</p> <p>Cleaning material and other tools: Tip cleaner, Wire brush (M.S.), Cleaning agents, Cleaning cloth, Waste container, Dust pan & brush set, Liquid soap, Hand towel</p>
3	<p>Understand process requirements, ensure</p>	<ul style="list-style-type: none"> Know different types of manufacturing processes used in industry. 	<p>PPT's and teaching aids</p> <p>Raw Materials: Sand,</p>

Sr. No.	Module	Key Learning Outcomes	Equipment Required
	<p>implementation and suggest process improvements</p> <p>Theory Duration (hh:mm) 30:00</p> <p>Practical Duration (hh:mm) 65:00</p> <p>Corresponding NOS Code ASC/N0016</p>	<ul style="list-style-type: none"> Identify requirement of raw materials used in the process. Identify and collect tools, jigs and fixtures required Perform maintenance of tools, jigs and fixtures Operate the machine in both, automatic and manual mode. Know basics of robotics, CNC operations, data acquisitions systems, automatic recording instruments. Make use of various measurement tools vernier callipers, micrometers, rulers, scales, weighing machines etc. Identify different types of defects in the final product. Analyse internal & external rejection data, planning and implement the corrective measures. Describe metallurgical and chemical properties of material. Demonstrate handling of electrical equipment and circuits, rectifiers and control panels. Identify the correct specifications in terms of thickness, hardness, durability, tightness, finesse etc. List various problems solving tools like 7QC, Why Why Analysis, Brain storming etc. Follow 5S practices in production line. Execute process improvement techniques like Kaizen, TQM, Poka Yoke at workplace. Carry out modifications in the process flow, process/ plant layout to improve the process TAT, operational ergonomics, work quality etc with the Process Engineering/ Industrial Engineering team. Use various business correspondence tools like Email, MS Office tools. 	<p>die</p> <p>Machinery: hoppers, pouring nozzles, mixers, pressing machines, feeders etc.</p> <p>Auxiliaries: bucket, pouring nozzles, ladles, spatulas, chippers etc.</p> <p>Shot blasting machine</p> <p>Fuel: Charcoal</p> <p>Measuring Tools: Steel tape, steel rule, vernier calliper, micrometer, compass</p> <p>Cutting Tools: Hacksaw frame adjustable, chisel, scissor, Sand paper</p> <p>Driving Tools: Chipping hammer, wooden mallet,</p> <p>Safety Materials: Fire extinguisher, Leather safety gloves, leather aprons, safety glasses, Ear Plug, Safety Shoe and First aid kit</p> <p>Cleaning material and other tools: Tip cleaner, Wire brush (M.S.), Cleaning agents, Cleaning cloth, Waste container, Dust pan & brush set, Liquid soap, Hand towel</p>
4.	<p>Manage production related operations of the shift/ line on a day to day basis</p> <p>Theory Duration (hh:mm) 30:00</p> <p>Practical Duration (hh:mm)</p>	<ul style="list-style-type: none"> Prepare effective shift planning based on manpower allocation. Develop shift rosters for the week and month based on the production plan. Prepare inventory requirements to stores and purchase department. Describe various functions of material management, stores, paint shop, assembly line, quality, safety, production planning etc. Perform end of line inspection. 	<p>PPT, Case studies, shift planning document or software, projector</p>

	equipment.				
	PC5. Ensure that the right casting and trimming methodology, process and parameters are in place for completing the work order before starting the casting and trimming process.		3	1	2
	PC6. Ensure that the material required and the equipment is available for executing the scheduled activity.		3	1	2
	PC7. Ensure that any modifications in the casting parameters are made within defined timelines (by selecting the right program from the machine control system) if required and ensure alignment with the prescribed standards.		4	1	3
	PC8. Ensure that required processes are in place for slag/impurities removal from molten metal.		3	1	2
	PC9. Ensure that the operator has input the correct temperature and other parameters are as per the casting requirement and the required operation code is set in the casting machine for it to cast the metal into desired shape.		3	1	2
	PC10. Analyse any irregularities in the process and recommend preventive steps as required.		4	1	3
	PC11. Ensure that help or advice from specialists if the problem is outside the operator's area of competence or experience.		4	1	3
	PC12. Establish linkages between rejection of output and the pertinent causes for the same (process/material etc.).		3	1	2
	PC13. Ensure that first and last castings from each batch are sent to the lab for quality check on its composition, soundness, nodularity etc. and a batch clearance is obtained from the lab.		3	1	2

PC14. Escalate all issues related to change in colour, surface properties etc. so that the manufacturing target can be achieved.	3	1	2
PC15. Ensure that the defective pieces are separated into two categories – pieces which can be repaired/modified and pieces which are beyond repair. Ensure that pieces beyond repair are discarded as per work instructions.	3	1	2
PC16. Recommend the means for rejection control to operators whenever required.	2	0	2
PC17. Ensure that the latest version of the available engineering drawing is available with the team and is adhered to ensure accurate casting.	3	1	2
PC18. Ensure that the required set of activities needed to complete the work order and final output are adhered to and that the process adopted in gravity casting is as per the Work Instructions/ SOPs.	3	1	2
PC19. Ensure that the assistant operator has the correct set of instructions to operate the casting machines.	3	1	2
PC20. Ensure that the right components are loaded in the chamber of the shot blasting machine and the required operation code is fed in the pressing machine for it to prepare the core.	3	1	2
PC21. Ensure that the type of sand and apparatus to be used for making the mould is correctly identified and the casting apparatus for molten metal carrying etc. are function properly.	3	1	2
PC22. Ensure that the apparatus for the selected sand making/ core making/mould making/casting process is as per the standards used in the industry.	4	1	3

	PC23. Oversee the sand feeding and mixing process and analyze the readings on various panels/meters to prevent machine breakdown/stoppages and deviations.		3	1	2
	PC24. Oversee the quality checks on output sand in terms of grain compressive strength etc.		4	1	3
	PC25. Ensure that any minor defects like excess slag, holes etc. are rectified via processes like fettling, chipping etc.		4	1	3
	PC26. Ensure that the first and last casting from each batch is sent to the lab for quality check on its composition, soundness, nodularity etc.		3	1	2
	PC27. Ensure that the final metal casting is as prescribed in the work order and the latest engineering drawings.		3	1	2
	PC28. In case the parts are not as per the given measurements, ensure that the same are sent for further processing in terms of chipping, fettling etc.		3	1	2
	PC29. Ensure that the final mould pattern is measured and compared with the dimensions as prescribed in the work order engineering drawing.		3	1	2
	PC30. Ensure timely escalation of any machine related issues regarding die setting to the machine setter in the plant		3	1	2
	PC31. Ensure that specialists look into the problem if it is outside the operator's area of competence or experience		3	1	2
	PC32. Analyse any irregularities in the processes and take preventive steps whenever required.		2	0	2
	Total		100	30	70
2. ASC/N0016 Understanding	PC1. Display detailed understanding of all the requisite processes to be adopted for completing the work order through reading the process manuals/ Work	100	3	1	2

	adherence to Safety standards by all employees and establish zero accident practice in the section.				
	PC23. Implement various business excellence techniques like Kaizen, 5S initiatives, etc. to enhance productivity for the plant/ shift.		3	1	2
	Total		100	30	70
3. ASC/N001 7 Manage the production related operations of the shift/ line on a day to day basis	PC1. Undertake effective shift planning based on manpower allocation and shift handling of place right manpower on the right workstation in coordination with Production In-charge to achieve production targets.	100	3	1	2
	PC2. Support the Shop Head/ Process head in finalizing the shift rosters for the week and month based on the production plan available.		4	1	3
	PC3. Send inventory requirements to Stores and Purchase department and follow up with stores and purchase to ensure timely receipt of material (Spares, Consumables).		4	1	3
	PC4. Ensure that the incoming raw material quality is inspected and meets the production requirement.		4	1	3
	PC5. Ensure that the material and work piece movement on the shop floor conforms to the TAT time prescribed in the SOP/ Work Plans so that production targets are met for the line/ shift.		4	1	3
	PC6. Ensure that the production plan shared by the PPC team is fulfilled during the shift/ across lines.		5	1	4
	PC7. Coordinate with various functions like material management, stores, paint shop, assembly line, quality, safety, production planning etc. to ensure communication of required information and resolution of queries.		5	1	4
	PC8. Responsible for End of Line Inspection under supervision.		5	1	4
	PC9. Ensure that the operators and helpers have the required tools and equipment at the start of the process.		6	2	4
	PC10. Identify & implement action steps to reduce losses and wastages during shift operation and ensure minimum rejection of components.		6	2	4

office area	waste as per the sorting work instructions			
	PC4. Ensure that all the operators are following the technique of waste disposal and waste storage in the designated bins	3	1	2
	PC5. Segregate the items which are labelled at red tag items for the process area and keep them in the correct places.	3	1	2
	PC6. Ensure that all the tools/ equipment/ fasteners/ spare parts are arranged as per specifications/ utility into proper trays, cabinets, lockers as mentioned in the 5S guidelines/ work instructions.	3	1	2
	PC7. Check for return of any type of extra material and tools to the designated sections and make sure that no additional material/ tool is lying near the work area.	5	2	3
	PC8. Oversee removal of unnecessary equipment, storage, furniture, unneeded inventory, supplies, parts and material.	4	1	3
	PC9. Ensure that areas of material storage areas are not overflowing.	4	1	3
	PC10. Ensure proper stacking and storage of the various types of boxes and containers as per the size/ utility to avoid any fall of items/ breakage and also enable easy sorting when required.	4	1	3
	PC11. Ensure that the team follows the given instructions and checks for labelling of fluids, oils, lubricants, solvents, chemicals etc. and proper storage of the same to avoid spillage, leakage, fire etc.	3	1	2
	PC12. Make sure that all material and tools are stored in the designated places and in the manner indicated in the 5S instructions.	4	1	3
	PC13. Ensure that organizing the workplace takes place with due considerations to the principles of wasted motions, ergonomics, work & method study.	4	1	3
	PC14. Ensure that the area has floors swept, machinery clean and is generally neat and tidy. In case of cleaning, ensure that correct displays are maintained on the floor which indicate potential safety hazards.	4	1	3
	PC15. Ensure workbenches and work surfaces are clean and in good condition.	3	1	2
	PC16. Ensure adherence to the cleaning schedule for the lighting system to ensure proper illumination.	4	1	3
	PC17. Ensure self-cleanliness - clean uniform,	3	1	2

