

Revised Application Documentation: Version 5 /25 May, 2019

QUALIFICATION FILE – CONTACT DETAILS OF SUBMITTING BODY

Name and address of submitting body:

Electronics Sector Skills Council of India,

422, Okhla Industrial Estate, Phase – III, New Delhi - 110020

Name and contact details of individual dealing with the submission

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List of documents submitted in support of the Qualifications File

1. Qualification Pack for Assembly Operator - Capacitor
2. Occupation Map
3. RFP for development of National Occupational Standards
4. Mapping of Manpower skills in IT Hardware and Electronics Industry – MAIT (2009)
http://www.essc-india.org/Essc/reports/MAIT0Report2008_15711.pdf
5. Approval of QP/ NOSs
 - a) Minutes of the meeting of GC
 - b) Composition of the Technical Committee
6. ESSCI IMaCS LMIS Report
7. List of Companies and industry associations which participated in the development of these qualifications packs
8. Assessment Procedure – Assessing bodies and Assessor

QUALIFICATION FILE SUMMARY

Qualification Title:	Assembly Operator - Capacitor; ELE/Q0108		
Body/bodies which will assess candidates	Electronics Sector Skills Council of India		
Body/bodies which will award the certificate for the qualification.	Electronics Sector Skills Council of India		
Body which will accredit providers to offer the qualification.	Electronics Sector Skills Council of India		
Occupation(s) to which the qualification gives access	Assembly Operator - Capacitor: The Assembly Operator operates various machines during the different steps of capacitor production and manufactures the final product.		
Proposed level of the qualification in the NSQF.	4		
Anticipated volume of training/learning required to complete the qualification.	240		
Entry requirements / recommendations.	12th standard passed, ITI/Diploma (Electrical/Electronics)		
Progression from the qualification.	Pinching Operator , Pressing Machine Operator , Masking Operator , Capping Operator , Silicon Painting Operator		
Planned arrangements for RPL.	Will be done at the place where required lab. Facility could be arranged.		
International Comparability.	Not established.		
Formal structure of the qualification			
Title of unit or other component (include any identification code used)	Mandatory/Optional	Estimated size (learning hours)	Level
ELE/N0113 Manufacture capacitor	Mandatory	140	4
ELE/N9919 Work with superiors and colleagues	Mandatory	50	4
ELE/N9920 Follow safety procedures	Mandatory	50	4

Please attach any document giving further detail about the structure of the qualification – eg a Curriculum or Qualification Pack.

Give details of the document here:

Refer Page 1 for the list of attachments

SECTION 1

ASSESSMENT

Name of assessment body:

If there will be more than one assessment body for this qualification, give details.

- **Aspiring Minds**
- **Mettl**
- **IQAG**

Will the assessment body be responsible for RPL assessment? Yes.

Give details of how RPL assessment for the qualification will be carried out and quality assured.

RPL will be based on the same Qualification Pack and Assessment Criteria mentioned in the QP. The process of RPL assessment is under development.

Describe the overall assessment strategy and specific arrangements which have been put in place to ensure that assessment is always valid, consistent and fair and show that these are in line with the requirements of the NSQF:

The emphasis is on practical demonstration of skills and knowledge based on the performance criteria. Assessment design team carries on research for understanding job details, followed with competencies mapping for the module and for the performance criteria. The assessment papers are created by the Subject Matter Experts and moderated by Assessment Designers of Assessment Partners as per the assessment criteria, for theory and practical questions considering the lab facility available for the assessments. The Assessment Sets prepared by Assessment Partners are reviewed by ESSCI for consistency and match with the level of the QP.

The assessment partners are instructed to hire assessors with integrity, reliability and fairness and have them sign an agreement confirming confidentiality, no conflict of interest or any other position, which may compromise the quality of assessment. The assessors need to have adequate hands-on experience in the domain, preferably at a level above the position for which they conduct the assessment.

Assessors are trained on the assessment process, and the question set. At the time of the assessment, the assessors check the identity of the candidates with a photo identification card and attendance during the training. They also take snapshots photographs of the practical assessments, and get the attendance for the assessment signed off by the candidate.

Please attach any documents giving further information about assessment and/or RPL.

Give details of the document(s) here:

ASSESSMENT EVIDENCE

Complete the following grid for each grouping of NOS, assessment unit or other component as listed in the entry on the structure of the qualification on page 1.

CRITERIA FOR ASSESSMENT OF TRAINEES

CRITERIA FOR ASSESSMENT OF TRAINEES

Job Role	Assembly Operator – Capacitor
QP #	ELE/Q0113
Sector Skill Council	Electronics Sector Skills Council of India

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. 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 criteria
5. To pass the Qualification Pack, every trainee should score a minimum of 70% in every NOS
6. In case of successfully passing only certain number of NOS's, the trainee is eligible to take subsequent assessment on the balance NOS's to pass the Qualification Pack.

Element	Performance Criteria	Total Marks (400)	Out Of	Marks Allocation	
				Theory	Skills Practical
ELE/N0113 Manufacture capacitor					
Understanding work requirement	PC1. interact with the supervisor in order to understand the day's production requirement	100	3	2	1
	PC2. plan the day's production activities based on the feedback obtained from superior		3	2	1
	PC3. use appropriate job instructions or work manuals		3	1	2
	PC4. ensure that all machines and equipment used in the production process are in safe working condition		3	1	2
Operating machines to produce capacitor	PC5. receive the metallized and slit raw material as per the size of the capacitor being manufactured		3	1	2
	PC6. receive cores of the capacitor from the supervisor		3	1	2
	PC7. load, set and operate the winding machine in order to wind the film on the core of the capacitor		3	1	2

	PC8. collect the wound capacitor and feed into the flattening machine	3	1	2
	PC9. making product and quantity settings and operate the flattening machine	3	1	2
	PC10. monitor the flattening process continuously	3	1	2
	PC11. collect any damaged capacitors and store in the reject section	3	1	2
	PC12. collect the flattened capacitor and load it into the protective coating machine	3	1	2
	PC13. load the protective tape on the machine, set speed and quantity and operate	3	1	2
	PC14. collect the output in the form of a circular disc and load it into the metal spraying machine, so as to spray a metal layer on the ends of the capacitor	3	1	2
	PC15. ensure that both ends of the capacitor are coated with uniformly with the metal layer	3	1	2
	PC16. remove the protective layer after the metal spraying process and load the capacitor on to the automated/semi automated welding machine	3	1	2
	PC17. load the lead wire on the machine and operate the machine in order to weld the leads to the capacitor	3	1	2
	PC18. place the capacitor inside a protective case before filling it with resin	3	1	2
	PC19. set type and quantity of resin to be filled as per the work instruction note	3	1	2
	PC20. place the capacitors in a bin and once it is filled, place the bin in the baking room for heat treatment	3	1	2
	PC21. collect the final product after specified period of time and send for testing	3	1	2
Reporting to supervisor	PC22. highlight any errors in previous step of the assembly process identified	3	1	2
	PC23. report defective or inadequate number of components	3	1	2
	PC24. report about inadequate quantity of consumables such as screws, nuts, etc.	3	1	2
Achieving productivity, quality and safety standards	PC25. meet 100% target for number of capacitors to be manufactured per day	2	1	1
	PC26. achieve 100% of planned work as scheduled	2	1	1
	PC27. achieve zero errors as per company's standards	2	1	1
	PC28. achieve zero damager because of electrostatic discharge	2	1	1

	PC29. keep work area clean and organised identify		2	1	1
	PC30. report any problems in the assembly line in time		2	1	1
	PC31. record any defects/inadequacies noted during the assembly process		2	1	1
	PC32. maintain safety standards as per company policy		2	1	1
	PC33. achieve clean work protocols		2	1	1
Undertaking preventive maintenance	PC34. ensure that the machines being operated work as specified		2	1	1
	PC35. investigate equipment malfunction and instruct on proper operation		2	1	1
	PC36. carry out preventive maintenance such as cleaning and replacing and repairing worn out parts as per manufacturer's specifications		2	1	1
Taking necessary safety precautions	PC37. use protective work gear such as gloves, shoes etc.		2	1	1
	PC38. keep work area clean and organised		2	1	1
		TOTAL	100	40	60
ELE/N9919 Work with superiors and colleagues					
Interacting with supervisor	PC1. understand work requirements by receiving instructions from reporting supervisor	100	8	3	5
	PC2. understand standard operating procedure of the company		8	3	5
	PC3. escalate problems that cannot be handled including repetitive PCB defects, machine failures, potential hazards, process disruptions, repairs and maintenance of machine		7	3	4
	PC4. report work completed and receive feedback on work done		7	3	4
	PC5. resolve personnel issues		7	3	4
	PC6. rectify errors as per feedback and minimize mistakes to zero in future		7	3	4
	PC7. communicate about process flow improvements, quality of output, product defects received from previous process, repairs and maintenance of tools and machinery as required and find technical solutions on specific issues		7	3	4
	PC8. handover completed work and deliver the work of expected quality despite constraints		7	3	4
Interacting with colleagues	PC9. collect required spares and raw materials from tool room or stores		7	2	5

	PC10. deposit unused or faulty materials, parts and tools to stores		7	2	5
	PC11. assist colleagues where necessary and as per capability		7	3	4
	PC12. resolve conflicts with colleagues at work to achieve smooth workflow		7	3	4
	PC13. complete rework in time based on feedback from quality or process departments		7	3	4
	PC14. put team over individual goals		7	3	4
		TOTAL	100	40	60
ELE/N9920 Follow safety procedures					
Understanding potential sources of accidents	PC1. spot and report potential hazards on time	100	5	2	3
	PC2. follow company policy and rules regarding hazardous materials		5	2	3
	PC3. avoid accidents related to use of potentially dangerous chemicals, gases, sharp tools and hazards from machines which involves exposure to possible injuries such as cuts, bites, stings, minor burns, etc.		5	2	3
	PC4. Handle with care when using an electrical drill and sharp cutting objects		5	2	3
Using safety gear	PC5. understand which safety gear must be used for a particular task		5	2	3
	PC6. eye, respiratory and hearing protection as per company policy		5	2	3
	PC7. use safety gear such as respirator, mask, skull caps, gloves, goggles, jacket , etc., as prescribed for the job		5	2	3
Understanding of safety procedures	PC8. comply with standard health and safety procedure followed in the company while handling an equipment and hazardous materials and tools or situations		5	2	3
	PC9. understand and follow the evacuation procedure properly such as fire drills, emergency evacuation procedures, first aid to self and others, etc., which help in case of an emergency		5	2	3
Following daily safety measure	PC10. take adequate safety measures while on work to prevent accidents		5	2	3
	PC11. ensure zero accidents in work		5	2	3
	PC12. avoid damage of components due to negligence in ESD procedures		5	2	3
	PC13. ensure no loss for company due to safety negligence		5	2	3
	PC14. ensure proper machine maintenance, work process achieving quality outputs as per the company standard		5	2	3
Communicating	PC15. improve process flow to reduce		6	2	4

to supervisor	anticipated or repetitive hazards			
	PC16. report on mishandling of tools, machines or hazardous materials and on electrical problems that could result in accident	6	2	4
	PC17. escalate about any hazardous materials or things found in the premises	6	2	4
	PC18. report about any breach of safety procedure in the company	6	3	3
	PC19. follow electrostatic discharge (ESD) measures for electronic component safety	6	3	3
TOTAL		100	40	60

SECTION 2

EVIDENCE OF NEED

What evidence is there that the qualification is needed?

Feedback from the industry was collected with respect to the past and projected industry growth, projected employee growth during next 5 years (Refer to Pages 14 to 27 of the LMIS report), skill gaps identified in entry level qualified workforce for the sub-sector (Refer to Page 31 of the LMIS report), and current employment number for the qualification (Refer to Occupation Map). This enabled prioritization of the development of the qualification packs.

What is the estimated uptake of this qualification and what is the basis of this estimate?

Estimated uptake of the qualification is obtained from the current employment (refer to the Occupation Map) times the projected employee growth for the sub-sector (Refer to Pages 21 to 27 of LMIS report). This is the basis for planning training with the industry and training providers.

What steps were taken to ensure that the qualification(s) does/do not duplicate already existing or planned qualifications in the NSQF?

NSDC QRC team checks and confirms this.

What arrangements are in place to monitor and review the qualification(s)? What data will be used and at what point will the qualification(s) be revised or updated?

Technical Committee's inputs are sought from time-to-time as needed to check the relevance of QP/ NOSs, and the revision exercise is undertaken, as needed.

Please attach any documents giving further information about any of the topics above.

Give details of the document(s) here:

Refer Page 1 for the list of attachments

SECTION 3

SUMMARY EVIDENCE OF LEVEL

Level of qualification: 4

Summary of Direct Evidence (from learning outcomes):

Qualification Title and Classification Code: Assembly Operator - Capacitor; ELE/Q0108					
Process Required	Professional Knowledge	Professional Skills	Core Skills	Responsibility	Level
The job holder on the job must be able to receive the metallized and slit raw material as per the size of the capacitor being manufactured, receive cores of the capacitor from the supervisor, load, set and operate the winding machine in order to wind the film on the core of the capacitor, collect the wound capacitor and feed into the flattening machine, making product and quantity settings and operate the flattening machine, collect the flattened capacitor and load it into the protective coating machine, load the protective tape on the	The job holder on the job needs to know and understand basic electronics and component identification , practical examples and applications of capacitors , basic electrical, AC / DC voltage, contactors and fuses , types of capacitors such as film capacitor, electrolytic capacitor etc. , Due to the requirement of Factual knowledge of the job requirements, this is pegged at level 4	The job holder on the job needs to know and understand how to operate/use various equipment and machines used in the manufacturing process of capacitors, how to operate the capacitor meter, multi-meter, how to use rulers, calipers, multi-meter, gauges or micrometers, voltmeters, ammeters and oscilloscopes and other testing equipment Since job holder is required to Recall and demonstrate practical skill, routine and repetitive using appropriate rule and tool, this is pegged at level 4	The job holder on the job needs to know and understand how to maintain necessary logs and records, to read job sheet, to operate computer, to read production schedules and operations manuals, to document the outcome Considering these outcomes, the job role is pegged at level 4.	The job holder must be able to Understand the work requirement, Operate machine set ups to produce capacitor, Report problems to supervisor, Achieve productivity, quality and safety standards as per company's policy, Take necessary safety precautions, The job holder is responsible for his own job and self-learning and no supervision of others and hence pegged at level 4.	4

<p>machine, set speed and quantity and operate, collect the output in the form of a circular disc and load it into the metal spraying machine, so as to spray a metal layer on the ends of the capacitor, load the lead wire on the machine and operate the machine, Considering the repetitive nature, it is pegged at level 4.</p>					
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Summary of other evidence (if used):

SECTION 4

EVIDENCE OF RECOGNITION OR PROGRESSION

What steps have been taken in the design of this or other qualifications to ensure that there is a clear path to other qualifications in this sector?

Vertical mobility options are available in the Occupation map.

Please attach any documents giving further information about any of the topics above.

Give details of the document(s) here:

Refer Page 1 for the list of attachments