Qualification Pack

Molding Process Engineer (Semiconductor)

QP Code: ELE/Q0119

Version: 3.0

NSQF Level: 5

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Qualification Pack

ELE/Q0119: Molding Process Engineer (Semiconductor)

Brief Job Description

Molding Process Engineer (Semiconductor) is responsible to work on failure analysis flow & to rectify the failures. He/ she is also responsible for verification and resolve by working together with several cross functional teams. Similarly, he is responsible for reliability flow, Test requirements as per JEDEC standards.

Personal Attributes

The individual must be physically fit to work for long durations. The person must have an aptitude for details and problem-solving skills with the ability to work in coordination with others. The individual should be able to communicate appropriately, both verbally and in writing.

Applicable National Occupational Standards (NOS)

Compulsory NOS:

1. ELE/N0125: Assess the Recipe/Program Readiness - Define Process Parameters
2. ELE/N0126: Analysis Data, Yield, Cost and Productivity Improvement
3. ELE/N0124: Verify the Design
4. ELE/N0127: Buy Machine curing ovens, off/Tools & Consumables Qualification
5. DGT/VSQ/N0102: Employability Skills (60 Hours)

Qualification Pack (QP) Parameters

Sector	Electronics
Sub-Sector	Semiconductor & Components
Occupation	Production-S&C
Country	India
NSQF Level	5
Credits	19
Aligned to NCO/ISCO/ISIC Code	NCO-2015/7223.2800

Minimum Educational Qualification & Experience	Completed 2nd year of UG (UG Diploma) (Physics/ Electronics/Electrical/Mechanical) with 1.5 years of experience Relevant Experience in Semiconductor & Components OR Completed 3 year diploma after 10th (Electronics/Electrical/Mechanical) with 3 Years of experience Relevant Experience in Semiconductor & Components OR Previous relevant Qualification of NSQF Level (4.5) with 1.5 years of experience Relevant Experience in Semiconductor & Components
Minimum Level of Education for Training in School	10th Class
Pre-Requisite License or Training	NA
Minimum Job Entry Age	18 Years
Last Reviewed On	NA
Next Review Date	31/10/2025
NSQC Approval Date	08/05/2025
Version	3.0
Reference code on NQR	QG-05-EH-03988-2025-V3-ESSCI
NQR Version	3.0

Remarks:

NA

Qualification Pack

ELE/N0125: Assess the Recipe/Program Readiness - Define Process Parameters

Description

The NOS unit is about the skills required to define and verify process parameters, prepare operator-friendly SOPs, manage production readiness, and oversee daily activities to ensure consistent quality, yield, and process compliance in semiconductor or electronics manufacturing.

Scope

The scope covers the following :

- Define Process Parameters
- Verify Process Parameters
- Prepare SOP
- Manage Daily Activity

Elements and Performance Criteria

Define Process Parameters

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

PC1. verify the product dimensions as well the strip dimensions

PC2. verify the package outline drawing and strip drawing

PC3. check the bonding force, pick & place location, curing parameters inside oven etc

PC4. verify all process parameters such as bonding force, placements, attaching speed, adhesive thickness, wafer and substrate location and moving speed etc

PC5. manage dummy samples

PC6. check measurement and see if all dimensions are within spec. or not

PC7. review the criteria if not meeting the spec criteria

PC8. verify input major parameters into SOP

PC9. monitor full SOP and release to production

PC10. review if any special requirement is needed

Verify Process Parameters

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

PC11. verify new products verification of process parameters is done like mention below

PC12. verify copy old recipe of similar program

PC13. review the changes as per product specification requirement

PC14. check dummies, do measurements, calculate Process Capability (CPK), Process Performance (PPK) & other quality parameters

PC15. check program if all ok the need to save

PC16. verify real product

PC17. check the product through quality and reliability checks

PC18. check mass production

Prepare SOP

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

PC19. knowledge of AUTO CAD

PC20. prepare Process flow with clear specifications like Temp., Speed, Water Flow, Vacuumed etc

PC21. verify mold Compound curing oven setup parameters should be included

PC22. prepare SOP in such a way so that it is more understandable to operators with pictures, visuals, data Charts etc.

PC23. manage train Operators on SOP Flow

PC24. prepare traveling card with the defined process or program name/ code

Manage Daily Activity

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

PC25. manage traveling cards to release production

PC26. manage regular monitoring of programs

PC27. check regular inspection of lot data such as yield, failure etc

PC28. test emergency situation

PC29. manage daily activity plan

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. the importance of verifying the product dimensions and strip dimensions

KU2. the importance of verifying the package outline drawing and strip drawing

KU3. how to check the bonding force, pick & place location, curing parameters inside the oven, etc.

KU4. the importance of verifying all process parameters, such as bonding force, placements, attaching speed, adhesive thickness, wafer and substrate location, moving speed, etc.

KU5. how to manage dummy samples

KU6. the importance of taking measurements to see if all dimensions are within specifications

KU7. the importance and process of reviewing the criteria if the specification criteria are not met

KU8. the process of inputting major parameters into an SOP

KU9. the importance of monitoring the full SOP and its release to production and reviewing for any special requirements

KU10. the importance of verifying the copied old recipe of a similar program

KU11. the importance of reviewing changes as per product specification requirements

KU12. the process of checking dummies, measurements, CPK, PPK and other quality parameters

KU13. how to verify the real product

KU14. the importance and process of checking the product through quality and reliability checks

KU15. the use AUTO CAD

KU16. the importance of preparing the process flow with clear specifications, such as temperature, speed, water flow, vacuum, etc.

KU17. the importance of preparing the SOP with pictures, visuals, and data charts so that it is more understandable to operators

KU18. the importance of training operators on the SOP flow

KU19. the importance of preparing the travelling card with the defined process or program name/ code

KU20. how to manage the release of traveling cards to production

KU21. the importance of conducting regular monitoring of programs

KU22. the importance of performing regular inspection of lot data, such as yield, failure, etc.

KU23. the importance of testing for emergencies

Generic Skills (GS)

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

GS1. maintain work-related notes and records

GS2. read the relevant literature to get the latest updates about the field of work

GS3. listen attentively to understand the information/ instructions being shared

GS4. communicate politely and professionally

GS5. plan and prioritize tasks to ensure timely completion

GS6. co-ordinate with the co-workers to achieve the work objectives

GS7. evaluate all possible solutions to a problem to select the best one

GS8. take quick decisions to deal with workplace emergencies/ accidents

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Define Process Parameters	**16**	**21**	**-**	**4**
PC1. verify the product dimensions as well the strip dimensions	-	-	-	-
PC2. verify the package outline drawing and strip drawing	-	-	-	-
PC3. check the bonding force, pick & place location, curing parameters inside oven etc	-	-	-	-
PC4. verify all process parameters such as bonding force, placements, attaching speed, adhesive thickness, wafer and substrate location and moving speed etc	-	-	-	-
PC5. manage dummy samples	-	-	-	-
PC6. check measurement and see if all dimensions are within spec. or not	-	-	-	-
PC7. review the criteria if not meeting the spec criteria	-	-	-	-
PC8. verify input major parameters into SOP	-	-	-	-
PC9. monitor full SOP and release to production	-	-	-	-
PC10. review if any special requirement is needed	-	-	-	-
Verify Process Parameters	**13**	**18**	**-**	**-**
PC11. verify new products verification of process parameters is done like mention below	-	-	-	-
PC12. verify copy old recipe of similar program	-	-	-	-
PC13. review the changes as per product specification requirement	-	-	-	-
PC14. check dummies, do measurements, calculate Process Capability (CPK), Process Performance (PPK) & other quality parameters	-	-	-	-
PC15. check program if all ok the need to save	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC16. verify real product	-	-	-	-
PC17. check the product through quality and reliability checks	-	-	-	-
PC18. check mass production	-	-	-	-
Prepare SOP	**6**	**6**	**-**	**3**
PC19. knowledge of AUTO CAD	-	-	-	-
PC20. prepare Process flow with clear specifications like Temp., Speed, Water Flow, Vacuumed etc	-	-	-	-
PC21. verify mold Compound curing oven setup parameters should be included	-	-	-	-
PC22. prepare SOP in such a way so that it is more understandable to operators with pictures, visuals, data Charts etc.	-	-	-	-
PC23. manage train Operators on SOP Flow	-	-	-	-
PC24. prepare traveling card with the defined process or program name/ code	-	-	-	-
Manage Daily Activity	**5**	**5**	**-**	**3**
PC25. manage traveling cards to release production	-	-	-	-
PC26. manage regular monitoring of programs	-	-	-	-
PC27. check regular inspection of lot data such as yield, failure etc	-	-	-	-
PC28. test emergency situation	-	-	-	-
PC29. manage daily activity plan	-	-	-	-
NOS Total	**40**	**50**	**-**	**10**

National Occupational Standards (NOS) Parameters

NOS Code	ELE/N0125
NOS Name	Assess the Recipe/Program Readiness - Define Process Parameters
Sector	Electronics
Sub-Sector	Semiconductor & Components
Occupation	Production-S&C
NSQF Level	5
Credits	5
Version	2.0
Last Reviewed Date	08/05/2025
Next Review Date	31/10/2025
NSQC Clearance Date	08/05/2025

ELE/N0126: Analysis Data, Yield, Cost and Productivity Improvement

Description

The NOS unit is about to covers verifying product quality through inspection and failure analysis, tracking yield data, conducting statistical analysis, and implementing strategies including DOE and CAD tools to enhance yield, reduce costs, and improve productivity across manufacturing operations.

Scope

The scope covers the following :

- Product Quality
- Yield Tracking
- Yield, Cost and Productivity Improvement

Elements and Performance Criteria

Product Quality

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

PC1. verify all strip outlines drawings with specifications

PC2. verify sample size for each lot to measure & inspect all molding related items

PC3. manage inspection & measurement techniques in SOP for operators

PC4. review collecting data, do statistics analysis if it is within specification release the lot to next step

PC5. check all consumables (Molding Compound) specifications clearly

PC6. manage regular inspections for each consumable

PC7. check failure at molding and it should be passed through failure analysis

PC8. review root cause of each failure

PC9. manage short term and long-term actions of failures to reduce the failure rate

PC10. verify 8D report

Yield Tracking

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

PC11. verify yield data collection for each product

PC12. verify the yield

PC13. manage data analysis using statistical methods

PC14. review ppt and present to management on WW bases

PC15. observe the necessary steps if the yield is lower than the target

PC16. monitor record for all failures along with actions to avoid future failure

Yield, Cost and Productivity Improvement

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

PC17. manage strategies for further improvements

PC18. verify Research and Development (R&D) to Improvements

PC19. check broad material to reduce cost
PC20. monitor working principle of machines to improve Unit per Hour (UPH)
PC21. verify Design of Experiments (DOE) Expertise
PC22. knowledge of running satistical tools such as JMP
PC23. manage regular interaction with customer, supplier, and internal teams
PC24. verify auto Computer-Aided Design (CAD) generated designs

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. the importance of verifying all strip outlines drawings with specifications
KU2. how to verify sample size for each lot to measure and inspect all molding related items
KU3. how to manage inspection and measurement techniques in the SOP for operators
KU4. the importance and process of reviewing the collecting data and performing statistical analysis to determine if it is within the specifications
KU5. the importance of checking all consumables, i.e. molding compound specifications and regularly inspecting for each consumable
KU6. the process of checking failure at molding and the importance of ensuring it passes through failure analysis
KU7. the importance of reviewing the root cause for each failure
KU8. the importance of managing short term and long-term actions of failures to reduce the failure rate
KU9. the importance of verifying yield data collection for each product
KU10. how to manage data analysis using statistical methods
KU11. the necessary steps to be taken if the yield is lower than the target
KU12. the importance of monitoring records for all failures along with actions to avoid future failure
KU13. appropriate strategies and Research and Development (R&D) for further improvements
KU14. the importance of monitoring the operations of machines to improve Unit per Hour (UPH)
KU15. how to develop Design of Experiments (DOE) Expertise
KU16. how to run satistical tools such as JMP
KU17. the importance of regularly interacting with customers, suppliers, and internal teams
KU18. the importance and process of verifying auto Computer-Aided Design (CAD) generated designs

Generic Skills (GS)

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

GS1. maintain the record of work-related observations
GS2. read the relevant literature to get the latest updates about the field of work
GS3. communicate politely and professionally
GS4. listen attentively to understand the information or instructions being given

GS5. co-ordinate with the co-workers to achieve the work objectives
GS6. plan and schedule tasks to achieve work efficiency
GS7. identify possible disruptions to work and take preventive measures
GS8. evaluate all possible solutions to a problem to select the best one
GS9. take quick decisions to deal with workplace emergencies or accidents

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Product Quality	**18**	**22**	**-**	**4**
PC1. verify all strip outlines drawings with specifications	-	-	-	-
PC2. verify sample size for each lot to measure & inspect all molding related items	-	-	-	-
PC3. manage inspection & measurement techniques in SOP for operators	-	-	-	-
PC4. review collecting data, do statistics analysis if it is within specification release the lot to next step	-	-	-	-
PC5. check all consumables (Molding Compound) specifications clearly	-	-	-	-
PC6. manage regular inspections for each consumable	-	-	-	-
PC7. check failure at molding and it should be passed through failure analysis	-	-	-	-
PC8. review root cause of each failure	-	-	-	-
PC9. manage short term and long-term actions of failures to reduce the failure rate	-	-	-	-
PC10. verify 8D report	-	-	-	-
Yield Tracking	**9**	**12**	**-**	**3**
PC11. verify yield data collection for each product	-	-	-	-
PC12. verify the yield	-	-	-	-
PC13. manage data analysis using statistical methods	-	-	-	-
PC14. review ppt and present to management on WW bases	-	-	-	-
PC15. observe the necessary steps if the yield is lower than the target	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC16. monitor record for all failures along with actions to avoid future failure	-	-	-	-
Yield, Cost and Productivity Improvement	**13**	**16**	**-**	**3**
PC17. manage strategies for further improvements	-	-	-	-
PC18. verify Research and Development (R&D) to Improvements	-	-	-	-
PC19. check broad material to reduce cost	-	-	-	-
PC20. monitor working principle of machines to improve Unit per Hour (UPH)	-	-	-	-
PC21. verify Design of Experiments (DOE) Expertise	-	-	-	-
PC22. knowledge of running satistical tools such as JMP	-	-	-	-
PC23. manage regular interaction with customer, supplier, and internal teams	-	-	-	-
PC24. verify auto Computer-Aided Design (CAD) generated designs	-	-	-	-
NOS Total	**40**	**50**	**-**	**10**

National Occupational Standards (NOS) Parameters

NOS Code	ELE/N0126
NOS Name	Analysis Data, Yield, Cost and Productivity Improvement
Sector	Electronics
Sub-Sector	Semiconductor & Components
Occupation	Production-S&C
NSQF Level	5
Credits	4
Version	2.0
Last Reviewed Date	08/05/2025
Next Review Date	31/10/2025
NSQC Clearance Date	08/05/2025

ELE/N0124: Verify the Design

Description

The NOS unit is about create and verify semiconductor packaging designs by utilizing CAD tools, interpreting customer and JEDEC specifications, analyzing competitor data, and ensuring compliance with stacking and bonding requirements.

Scope

The scope covers the following :

- Design Creation
- Understanding of stacking structure
- Design Verification

Elements and Performance Criteria

Design Creation

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

PC1. knowledge of Auto CAD or equivalent design tool

PC2. knowledge of wafer structure and processing, wire materials properties

PC3. collect customer requirements

PC4. collect data from competitor’s specs

PC5. perform reverse analysis to get the die to attach and wire bonding specifications

Understanding of stacking structure

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

PC6. identify the critical and normal dimensions requirements as per customer specification

PC7. define the dimension's specification to meet customer requirements

PC8. knowledge of Joint Electron Device Engineering Council (JEDEC) standard

PC9. identify customer bonding diagram

PC10. specify wire bonding material that fulfills bonding drawing and electrical, mechanical, and thermal specifications

PC11. perform drawing activities

Design Verification

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

PC12. identify bonding drawing

PC13. verify die-attach staking structure

PC14. verify rubber tip for die attach and capillary for wire bonding drawing

PC15. identify magazine drawing

PC16. identify cassete drawing

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. the use of Auto CAD and other equivalent design tools
KU2. the wafer structure and processing, and wire material properties
KU3. the importance of determining the customer requirements and collecting data from competitors' specs
KU4. how to perform reverse analysis to get the die to attach and wire bonding specifications
KU5. the importance of identifying the critical and normal dimension requirements as per the customer requirements
KU6. the importance and process of defining the dimension specifications to meet the customer requirements
KU7. the Joint Electron Device Engineering Council (JEDEC) standard
KU8. the customer bonding diagram
KU9. the importance of specifying the wire bonding material that fulfils the bonding drawing and electrical, mechanical, and thermal specifications
KU10. how to perform drawing activities bonding drawing
KU11. how to verify the die-attach staking structure
KU12. how to verify rubber tip for die attach and capillary for wire bonding drawing
KU13. how to identify magazine drawing and cassette drawing

Generic Skills (GS)

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

GS1. maintain the record of work-related observations
GS2. read the relevant literature to get the latest updates about the field of work
GS3. communicate politely and professionally
GS4. listen attentively to understand the information or instructions being given
GS5. co-ordinate with the co-workers to achieve the work objectives
GS6. plan and schedule tasks to achieve work efficiency
GS7. identify possible disruptions to work and take preventive measures
GS8. evaluate all possible solutions to a problem to select the best one
GS9. take quick decisions to deal with workplace emergencies or accidents

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Design Creation	**14**	**18**	**-**	**5**
PC1. knowledge of Auto CAD or equivalent design tool	-	-	-	-
PC2. knowledge of wafer structure and processing, wire materials properties	-	-	-	-
PC3. collect customer requirements	-	-	-	-
PC4. collect data from competitor’s specs	-	-	-	-
PC5. perform reverse analysis to get the die to attach and wire bonding specifications	-	-	-	-
Understanding of stacking structure	**18**	**22**	**-**	**3**
PC6. identify the critical and normal dimensions requirements as per customer specification	-	-	-	-
PC7. define the dimension's specification to meet customer requirements	-	-	-	-
PC8. knowledge of Joint Electron Device Engineering Council (JEDEC) standard	-	-	-	-
PC9. identify customer bonding diagram	-	-	-	-
PC10. specify wire bonding material that fulfills bonding drawing and electrical, mechanical, and thermal specifications	-	-	-	-
PC11. perform drawing activities	-	-	-	-
Design Verification	**8**	**10**	**-**	**2**
PC12. identify bonding drawing	-	-	-	-
PC13. verify die-attach staking structure	-	-	-	-
PC14. verify rubber tip for die attach and capillary for wire bonding drawing	-	-	-	-
PC15. identify magazine drawing	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC16. identify cassete drawing	-	-	-	-
NOS Total	**40**	**50**	**-**	**10**

Qualification Pack

National Occupational Standards (NOS) Parameters

NOS Code	ELE/N0124
NOS Name	Verify the Design
Sector	Electronics
Sub-Sector	Semiconductor & Components
Occupation	Production-S&C
NSQF Level	5
Credits	4
Version	2.0
Last Reviewed Date	08/05/2025
Next Review Date	31/10/2025
NSQC Clearance Date	08/05/2025

ELE/N0127: Buy Machine curing ovens, off/Tools & Consumables Qualification

Description

The NOS unit is about to conduct and validate Factory and Site Acceptance Tests, and manage consumable and raw material qualifications to ensure equipment, process, and material readiness for mass production.

Scope

The scope covers the following :

- Factory Acceptance test at equipment manufacturer site
- Site Acceptance test at product manufacturer site
- Consumable and Raw Material Qualification

Elements and Performance Criteria

Factory Acceptance test at equipment manufacturer site

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

PC1. verify File Allocation table (FAT) creation

PC2. ensure that the report adheres to verify the dimension's specification to meet customer requirements

PC3. verify general machine specification (operation, main controller, main panel should function as per requirements given to manufacturer)

PC4. manage all equipment consumables specifications, dimensions and other parameters should be clearly defined by process and equipment engineer

PC5. verify equipment and well as process parameters should DMAT during testing at site

PC6. verify the sample size required to buy off machines and should be defined clearly with specification and CPK Requirements

PC7. check all material through equipment along with manufacturers team

PC8. verify solid report to avoid any future issues

PC9. ensure to approve and keep it for record

Site Acceptance test at product manufacturer site

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

PC10. verify File Allocation table (FAT) creation

PC11. ensure that the report adheres to verify the dimension's specification to meet customer requirements

PC12. verify general machine specification (operation, main controller, main panel should function as per requirements given to manufacturer)

PC13. manage all equipment consumables specifications, dimensions and other parameters should be clearly defined by process and equipment engineer

PC14. verify equipment and well as process parameters should DMAT during testing at site

PC15. verify the sample size required to buy off machines and should be defined clearly with specification and CPK Requirements

PC16. check all material through equipment along with manufacturers team

PC17. verify solid report to avoid any future issues

PC18. ensure to approve and keep it for record

Consumable and Raw Material Qualification

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

PC19. verify low cost and high reliable raw material and consumables

PC20. verify new material to Design DOE

PC21. manage the quality and realibity data for each characterization, feasibility and qualification build

PC22. ensure to generate PCN (Process Change Notification)

PC23. prepare qualification report and present to management

PC24. verify Low Volume Mass Production (LVM) and peer production team to make seamless transition and high-volume mass production

PC25. check all characterization phase, feasibility phase, customer samples phase and qualification phase

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. how to verify File Allocation Table (FAT) creation

KU2. the importance of ensuring the report adheres to verify the dimension specifications to meet the customer requirements

KU3. the importance of ensuring the functioning of the main controller and the main panel as per requirements given to the manufacturer

KU4. the importance of ensuring all equipment consumable specifications, dimensions and other parameters are clearly defined by the process and equipment engineer

KU5. the importance of verifying equipment and process parameters

KU6. the importance of ensuring the sample size required to buy off machines is defined clearly with specification and CPK Requirements

KU7. the importance of verifying low cost and high reliable raw material and consumables

KU8. the importance of managing the quality and reliability data for each characterization, feasibility and qualification build

KU9. how to generate Process Change Notification (PCN)

KU10. how to prepare a qualification report

KU11. the process of transition from low volume mass production to high-volume mass production

KU12. the importance of checking characterization phase, feasibility phase, customer samples phase and qualification phase

Generic Skills (GS)

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

GS1. maintain work-related notes and records
GS2. read the relevant literature to get the latest updates about the field of work
GS3. listen attentively to understand the information/ instructions being shared
GS4. communicate politely and professionally
GS5. plan and prioritize tasks to ensure timely completion
GS6. co-ordinate with the co-workers to achieve the work objectives
GS7. evaluate all possible solutions to a problem to select the best one
GS8. take quick decisions to deal with workplace emergencies/ accidents

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Factory Acceptance test at equipment manufacturer site	**15**	**20**	**-**	**4**
PC1. verify File Allocation table (FAT) creation	-	-	-	-
PC2. ensure that the report adheres to verify the dimension's specification to meet customer requirements	-	-	-	-
PC3. verify general machine specification (operation, main controller, main panel should function as per requirements given to manufacturer)	-	-	-	-
PC4. manage all equipment consumables specifications, dimensions and other parameters should be clearly defined by process and equipment engineer	-	-	-	-
PC5. verify equipment and well as process parameters should DMAT during testing at site	-	-	-	-
PC6. verify the sample size required to buy off machines and should be defined clearly with specification and CPK Requirements	-	-	-	-
PC7. check all material through equipment along with manufacturers team	-	-	-	-
PC8. verify solid report to avoid any future issues	-	-	-	-
PC9. ensure to approve and keep it for record	-	-	-	-
Site Acceptance test at product manufacturer site	**14**	**16**	**-**	**3**
PC10. verify File Allocation table (FAT) creation	-	-	-	-
PC11. ensure that the report adheres to verify the dimension's specification to meet customer requirements	-	-	-	-
PC12. verify general machine specification (operation, main controller, main panel should function as per requirements given to manufacturer)	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC13. manage all equipment consumables specifications, dimensions and other parameters should be clearly defined by process and equipment engineer	-	-	-	-
PC14. verify equipment and well as process parameters should DMAT during testing at site	-	-	-	-
PC15. verify the sample size required to buy off machines and should be defined clearly with specification and CPK Requirements	-	-	-	-
PC16. check all material through equipment along with manufacturers team	-	-	-	-
PC17. verify solid report to avoid any future issues	-	-	-	-
PC18. ensure to approve and keep it for record	-	-	-	-
Consumable and Raw Material Qualification	**11**	**14**	**-**	**3**
PC19. verify low cost and high reliable raw material and consumables	-	-	-	-
PC20. verify new material to Design DOE	-	-	-	-
PC21. manage the quality and realibity data for each characterization, feasibility and qualification build	-	-	-	-
PC22. ensure to generate PCN (Process Change Notification)	-	-	-	-
PC23. prepare qualification report and present to management	-	-	-	-
PC24. verify Low Volume Mass Production (LVM) and peer production team to make seamless transition and high-volume mass production	-	-	-	-
PC25. check all characterization phase, feasibility phase, customer samples phase and qualification phase	-	-	-	-
NOS Total	**40**	**50**	**-**	**10**

National Occupational Standards (NOS) Parameters

NOS Code	ELE/N0127
NOS Name	Buy Machine curing ovens, off/Tools & Consumables Qualification
Sector	Electronics
Sub-Sector	Semiconductor & Components
Occupation	Production-S&C
NSQF Level	5
Credits	4
Version	2.0
Last Reviewed Date	08/05/2025
Next Review Date	31/10/2025
NSQC Clearance Date	08/05/2025

Qualification Pack

DGT/VSQ/N0102: Employability Skills (60 Hours)

Description

This unit is about employability skills, Constitutional values, becoming a professional in the 21st Century, digital, financial, and legal literacy, diversity and Inclusion, English and communication skills, customer service, entrepreneurship, and apprenticeship, getting ready for jobs and career development.

Scope

The scope covers the following :

- Introduction to Employability Skills
- Constitutional values - Citizenship
- Becoming a Professional in the 21st Century
- Basic English Skills
- Career Development & Goal Setting
- Communication Skills
- Diversity & Inclusion
- Financial and Legal Literacy
- Essential Digital Skills
- Entrepreneurship
- Customer Service
- Getting ready for Apprenticeship & Jobs

Elements and Performance Criteria

Introduction to Employability Skills

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

PC1. identify employability skills required for jobs in various industries

PC2. identify and explore learning and employability portals

Constitutional values – Citizenship

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

PC3. recognize the significance of constitutional values, including civic rights and duties, citizenship, responsibility towards society etc. and personal values and ethics such as honesty, integrity, caring and respecting others, etc.

PC4. follow environmentally sustainable practices

Becoming a Professional in the 21st Century

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

PC5. recognize the significance of 21st Century Skills for employment

PC6. practice the 21st Century Skills such as Self-Awareness, Behaviour Skills, time management, critical and adaptive thinking, problem-solving, creative thinking, social and cultural awareness, emotional awareness, learning to learn for continuous learning etc. in personal and professional life

Basic English Skills

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

PC7. use basic English for everyday conversation in different contexts, in person and over the telephone

PC8. read and understand routine information, notes, instructions, mails, letters etc. written in English

PC9. write short messages, notes, letters, e-mails etc. in English

Career Development & Goal Setting

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

PC10. understand the difference between job and career

PC11. prepare a career development plan with short- and long-term goals, based on aptitude

Communication Skills

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

PC12. follow verbal and non-verbal communication etiquette and active listening techniques in various settings

PC13. work collaboratively with others in a team

Diversity & Inclusion

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

PC14. communicate and behave appropriately with all genders and PwD

PC15. escalate any issues related to sexual harassment at workplace according to POSH Act

Financial and Legal Literacy

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

PC16. select financial institutions, products and services as per requirement

PC17. carry out offline and online financial transactions, safely and securely

PC18. identify common components of salary and compute income, expenses, taxes, investments etc

PC19. identify relevant rights and laws and use legal aids to fight against legal exploitation

Essential Digital Skills

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

PC20. operate digital devices and carry out basic internet operations securely and safely

PC21. use e- mail and social media platforms and virtual collaboration tools to work effectively

PC22. use basic features of word processor, spreadsheets, and presentations

Entrepreneurship

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

PC23. identify different types of Entrepreneurship and Enterprises and assess opportunities for potential business through research

PC24. develop a business plan and a work model, considering the 4Ps of Marketing Product, Price, Place and Promotion

PC25. identify sources of funding, anticipate, and mitigate any financial/ legal hurdles for the potential business opportunity

Customer Service

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

PC26. identify different types of customers

PC27. identify and respond to customer requests and needs in a professional manner.

PC28. follow appropriate hygiene and grooming standards

Getting ready for apprenticeship & Jobs

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

PC29. create a professional Curriculum vitae (Résumé)

PC30. search for suitable jobs using reliable offline and online sources such as Employment exchange, recruitment agencies, newspapers etc. and job portals, respectively

PC31. apply to identified job openings using offline /online methods as per requirement

PC32. answer questions politely, with clarity and confidence, during recruitment and selection

PC33. identify apprenticeship opportunities and register for it as per guidelines and requirements

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. need for employability skills and different learning and employability related portals

KU2. various constitutional and personal values

KU3. different environmentally sustainable practices and their importance

KU4. Twenty first (21st) century skills and their importance

KU5. how to use English language for effective verbal (face to face and telephonic) and written communication in formal and informal set up

KU6. importance of career development and setting long- and short-term goals

KU7. about effective communication

KU8. POSH Act

KU9. Gender sensitivity and inclusivity

KU10. different types of financial institutes, products, and services

KU11. how to compute income and expenditure

KU12. importance of maintaining safety and security in offline and online financial transactions

KU13. different legal rights and laws

KU14. different types of digital devices and the procedure to operate them safely and securely

KU15. how to create and operate an e- mail account and use applications such as word processors, spreadsheets etc.

KU16. how to identify business opportunities

KU17. types and needs of customers

KU18. how to apply for a job and prepare for an interview

KU19. apprenticeship scheme and the process of registering on apprenticeship portal

Generic Skills (GS)

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

GS1. read and write different types of documents/instructions/correspondence

GS2. communicate effectively using appropriate language in formal and informal settings

GS3. behave politely and appropriately with all
GS4. how to work in a virtual mode
GS5. perform calculations efficiently
GS6. solve problems effectively
GS7. pay attention to details
GS8. manage time efficiently
GS9. maintain hygiene and sanitization to avoid infection

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Introduction to Employability Skills	**1**	**1**	**-**	**-**
PC1. identify employability skills required for jobs in various industries	-	-	-	-
PC2. identify and explore learning and employability portals	-	-	-	-
Constitutional values – Citizenship	**1**	**1**	**-**	**-**
PC3. recognize the significance of constitutional values, including civic rights and duties, citizenship, responsibility towards society etc. and personal values and ethics such as honesty, integrity, caring and respecting others, etc.	-	-	-	-
PC4. follow environmentally sustainable practices	-	-	-	-
Becoming a Professional in the 21st Century	**2**	**4**	**-**	**-**
PC5. recognize the significance of 21st Century Skills for employment	-	-	-	-
PC6. practice the 21st Century Skills such as Self-Awareness, Behaviour Skills, time management, critical and adaptive thinking, problem-solving, creative thinking, social and cultural awareness, emotional awareness, learning to learn for continuous learning etc. in personal and professional life	-	-	-	-
Basic English Skills	**2**	**3**	**-**	**-**
PC7. use basic English for everyday conversation in different contexts, in person and over the telephone	-	-	-	-
PC8. read and understand routine information, notes, instructions, mails, letters etc. written in English	-	-	-	-
PC9. write short messages, notes, letters, e-mails etc. in English	-	-	-	-
Career Development & Goal Setting	**1**	**2**	**-**	**-**

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC10. understand the difference between job and career	-	-	-	-
PC11. prepare a career development plan with short- and long-term goals, based on aptitude	-	-	-	-
Communication Skills	**2**	**2**	**-**	**-**
PC12. follow verbal and non-verbal communication etiquette and active listening techniques in various settings	-	-	-	-
PC13. work collaboratively with others in a team	-	-	-	-
Diversity & Inclusion	**1**	**2**	**-**	**-**
PC14. communicate and behave appropriately with all genders and PwD	-	-	-	-
PC15. escalate any issues related to sexual harassment at workplace according to POSH Act	-	-	-	-
Financial and Legal Literacy	**2**	**3**	**-**	**-**
PC16. select financial institutions, products and services as per requirement	-	-	-	-
PC17. carry out offline and online financial transactions, safely and securely	-	-	-	-
PC18. identify common components of salary and compute income, expenses, taxes, investments etc	-	-	-	-
PC19. identify relevant rights and laws and use legal aids to fight against legal exploitation	-	-	-	-
Essential Digital Skills	**3**	**4**	**-**	**-**
PC20. operate digital devices and carry out basic internet operations securely and safely	-	-	-	-
PC21. use e- mail and social media platforms and virtual collaboration tools to work effectively	-	-	-	-
PC22. use basic features of word processor, spreadsheets, and presentations	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Entrepreneurship	**2**	**3**	**-**	**-**
PC23. identify different types of Entrepreneurship and Enterprises and assess opportunities for potential business through research	-	-	-	-
PC24. develop a business plan and a work model, considering the 4Ps of Marketing Product, Price, Place and Promotion	-	-	-	-
PC25. identify sources of funding, anticipate, and mitigate any financial/ legal hurdles for the potential business opportunity	-	-	-	-
Customer Service	**1**	**2**	**-**	**-**
PC26. identify different types of customers	-	-	-	-
PC27. identify and respond to customer requests and needs in a professional manner.	-	-	-	-
PC28. follow appropriate hygiene and grooming standards	-	-	-	-
Getting ready for apprenticeship & Jobs	**2**	**3**	**-**	**-**
PC29. create a professional Curriculum vitae (Résumé)	-	-	-	-
PC30. search for suitable jobs using reliable offline and online sources such as Employment exchange, recruitment agencies, newspapers etc. and job portals, respectively	-	-	-	-
PC31. apply to identified job openings using offline /online methods as per requirement	-	-	-	-
PC32. answer questions politely, with clarity and confidence, during recruitment and selection	-	-	-	-
PC33. identify apprenticeship opportunities and register for it as per guidelines and requirements	-	-	-	-
NOS Total	**20**	**30**	**-**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	DGT/VSQ/N0102
NOS Name	Employability Skills (60 Hours)
Sector	Cross Sectoral
Sub-Sector	Professional Skills
Occupation	Employability
NSQF Level	4
Credits	2
Version	1.0
Last Reviewed Date	08/05/2025
Next Review Date	31/10/2025
NSQC Clearance Date	08/05/2025

Assessment Guidelines and Assessment Weightage

Assessment Guidelines

1. Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Performance Criteria (PC) will be assigned marks proportional to its importance in NOS. SSC will also lay down 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 centre (as per assessment criteria below).

5. Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/training centre based on this criterion.

6. To pass the Qualification Pack, every trainee should score a minimum of 70% of aggregate marks to successfully clear the assessment.

7. In case of unsuccessful completion, the trainee may seek reassessment on the Qualification Pack.

Minimum Aggregate Passing % at QP Level : 70

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

Assessment Weightage

Compulsory NOS

National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
ELE/N0125.Assess the Recipe/Program Readiness - Define Process Parameters	40	50	0	10	100	20
ELE/N0126.Analysis Data, Yield, Cost and Productivity Improvement	40	50	0	10	100	20
ELE/N0124.Verify the Design	40	50	0	10	100	20
ELE/N0127.Buy Machine curing ovens, off/Tools & Consumables Qualification	40	50	0	10	100	20
DGT/VSQ/N0102.Employability Skills (60 Hours)	20	30	-	-	50	20
Total	**180**	**230**	**0**	**40**	**450**	**100**

Acronyms

NOS	National Occupational Standard(s)
NSQF	National Skills Qualifications Framework
QP	Qualifications Pack
TVET	Technical and Vocational Education and Training

Glossary

Sector	Sector is a conglomeration of different business operations having similar business and interests. It may also be defined as a distinct subset of the economy whose components share similar characteristics and interests.
Sub-sector	Sub-sector is derived from a further breakdown based on the characteristics and interests of its components.
Occupation	Occupation is a set of job roles, which perform similar/ related set of functions in an industry.
Job role	Job role defines a unique set of functions that together form a unique employment opportunity in an organisation.
Occupational Standards (OS)	OS specify the standards of performance an individual must achieve when carrying out a function in the workplace, together with the Knowledge and Understanding (KU) they need to meet that standard consistently. Occupational Standards are applicable both in the Indian and global contexts.
Performance Criteria (PC)	Performance Criteria (PC) are statements that together specify the standard of performance required when carrying out a task.
National Occupational Standards (NOS)	NOS are occupational standards which apply uniquely in the Indian context.
Qualifications Pack (QP)	QP comprises the set of OS, together with the educational, training and other criteria required to perform a job role. A QP is assigned a unique qualifications pack code.
Unit Code	Unit code is a unique identifier for an Occupational Standard, which is denoted by an 'N'
Unit Title	Unit title gives a clear overall statement about what the incumbent should be able to do.
Description	Description gives a short summary of the unit content. This would be helpful to anyone searching on a database to verify that this is the appropriate OS they are looking for.
Scope	Scope is a set of statements specifying the range of variables that an individual may have to deal with in carrying out the function which have a critical impact on quality of performance required.

Knowledge and Understanding (KU)	Knowledge and Understanding (KU) are statements which together specify the technical, generic, professional and organisational specific knowledge that an individual needs in order to perform to the required standard.
Organisational Context	Organisational context includes the way the organisation is structured and how it operates, including the extent of operative knowledge managers have of their relevant areas of responsibility.
Technical Knowledge	Technical knowledge is the specific knowledge needed to accomplish specific designated responsibilities.
Core Skills/ Generic Skills (GS)	Core skills or Generic Skills (GS) are a group of skills that are the key to learning and working in today's world. These skills are typically needed in any work environment in today's world. These skills are typically needed in any work environment. In the context of the OS, these include communication related skills that are applicable to most job roles.
Electives	Electives are NOS/set of NOS that are identified by the sector as contributive to specialization in a job role. There may be multiple electives within a QP for each specialized job role. Trainees must select at least one elective for the successful completion of a QP with Electives.
Options	Options are NOS/set of NOS that are identified by the sector as additional skills. There may be multiple options within a QP. It is not mandatory to select any of the options to complete a QP with Options.