







Welding Operator Electronics

QP Code: ELE/Q0102

Version: 3.0

NSQF Level: 3

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ELE/Q0102: Welding Operator Electronics

Brief Job Description

A Welding Operator Electronics is responsible for bonding the electro-tinned copper lead wire to the centre of steel and cap, of the resistor by welding process.

Personal Attributes

The job requires the individual to have attention to details and ability to work for long hours generally in a sitting position.

Applicable National Occupational Standards (NOS)

Compulsory NOS:

- 1. ELE/N0102: Weld the copper lead wire to resistor
- 2. ELE/N9972: Communicate and coordinate effectively with others
- 3. ELE/N1003: Work effectively, sustainably and safely

Qualification Pack (QP) Parameters

Sector	Electronics
Sub-Sector	Semiconductor & Components
Occupation	Production
Country	India
NSQF Level	3
Credits	NA
Aligned to NCO/ISCO/ISIC Code	NCO-2004/NIL





Minimum Educational Qualification & Experience	8th Class with 2 Years of experience in the relevant field OR 10th Class ((with 06 months of relevant Experience) OR I.T.I (after 8th)) OR Certificate-NSQF (Level-2 in the domain of (Electronics / Electrical / Mechanical)) with 2 Years of experience in the relevant field
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	27/01/2022
Next Review Date	02/06/2025
Deactivation Date	31/07/2024
NSQC Approval Date	27/01/2022
Version	3.0
Reference code on NQR	2022/EHW/ESSC/05107
NQR Version	1.0

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Oualification Pack



ELE/N0102: Weld the copper lead wire to resistor

Description

This OS unit is about welding the electro-tinned copper lead wire to the centre of steel and cap, bonding to the resistor by welding equipment as per specifications.

Scope

The scope covers the following:

- Identify the work requirement
- Set up and operate the welding equipment
- Check the welding quality
- Undertake preventive maintenance of welding equipment
- · Achieve productivity and quality standards

Elements and Performance Criteria

Identify the work requirement

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

- **PC1.** read and interpret the job sheet, work instructions and SOP to determine the specifications and requirements of the job
- **PC2.** collect the required materials and equipment for welding from store by following organisational procedures
- **PC3.** identify the various welding parameters such as temperature, pressure, electrode type, electrode distance or gap, welding current, voltage, process time etc. before starting the welding process

Set up and operate the welding equipment

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

- **PC4.** compare the thickness of copper wire, filler material and flux required for welding process
- **PC5.** set the welding machine, apparatus and accessories appropriately based on the size of cap and load on the machine
- **PC6.** install and align the work pieces on the welding apparatus appropriately so that they do not turn or fall down during welding work
- **PC7.** add chemicals to work pieces to ensure bonding
- **PC8.** program operating instructions into the computers to adjust and start the welding machine
- **PC9.** set or adjust the welding parameters as per the job requirements
- **PC10.** adjust welding heads and tooling according to work specifications
- **PC11.** operate the welding machine as specified in work order and sop to weld the electro tinned copper lead wire to the centre of steel and cap
- **PC12.** unload the completed work pieces from the machine after completion of welding process by using appropriate tools
- **PC13.** monitor the welding process and machine constantly to obtain the desired output

Check the welding quality

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





- **PC14.** visually inspect the welded workpiece for various quality defects and to ensure conformance to required specifications
- **PC15.** repair the workpiece, if needed

Undertake preventive maintenance of welding equipment

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

- **PC16.** perform regular cleaning of machine, equipment and work area as prescribed by machine manufacturer
- **PC17.** ensure damage and defect-free machine with zero unscheduled downtime

Achieve productivity and quality of standards

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

- PC18. check the final workpiece completely to avoid rejections
- **PC19.** ensure timely delivery of zero defect welded work piece to the next stage
- **PC20.** maintain the records and documents related to the outcome of weld performed as per the organisational standards and procedures

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- **KU1.** companys policies on: incentives, delivery standards and personnel management
- **KU2.** work flow involved in production process of the company
- **KU3.** importance of the individuals role in the workflow
- **KU4.** reporting structure
- **KU5.** profile of clients
- **KU6.** component stocking policy
- **KU7.** safety and quality standards followed in the organization
- **KU8.** basic electronics and component identification
- **KU9.** welding machine functioning and controls
- **KU10.** basic programming, setting up and loading the work pieces
- KU11. different types of welding processes, parameters and associated equipment
- **KU12.** different cleaning methods for electrodes, metal surfaces, etc.
- KU13. welding versus soldering
- KU14. ohm value and tolerances
- **KU15.** colour codes and polarity of components
- **KU16.** raw materials, production processes, quality control, costs, and other techniques
- **KU17.** machines and tools, including their designs, uses, repair, and maintenance
- **KU18.** electro-static discharge (ESD) precautions and 5S standards
- **KU19.** commonly occurring machine and component defects
- KU20. how to operate compute
- KU21. how to use basic math skills for setting up of welding machine
- **KU22.** how to operate the welding machine and equipment to weld the copper lead wire to resistor
- **KU23.** how to use measuring instruments like callipers, micro-meters





Generic Skills (GS)

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

- **GS1.** note problems on job sheet and details of work done
- **GS2.** maintain necessary logs and records
- **GS3.** document the outcome
- **GS4.** read job sheets, process, production schedules, machine operations manuals
- **GS5.** read the standard operating procedures
- **GS6.** interpret instructions furnished in written, oral or schedule form
- **GS7.** communicate in local language
- **GS8.** effectively communicate with the supervisor on the process issues
- **GS9.** effectively communicate maintenance issues to the maintenance personnel
- **GS10.** be able to work on multiple lots at a time, as instructed
- **GS11.** work as a team and deliver on time to next work process
- **GS12.** maintain personal grooming
- GS13. identify and resolve problem during sorting process
- **GS14.** troubleshoot and correct mechanical problems and any other problem with the machine with adjusting or even stopping, right on the spot
- **GS15.** reduce repetitive errors
- **GS16.** improve work process
- GS17. spot process disruptions and delays





Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Identify the work requirement	7	7	-	-
PC1. read and interpret the job sheet, work instructions and SOP to determine the specifications and requirements of the job	2	2	-	-
PC2. collect the required materials and equipment for welding from store by following organisational procedures	2	2	-	-
PC3. identify the various welding parameters such as temperature, pressure, electrode type, electrode distance or gap, welding current, voltage, process time etc. before starting the welding process	3	3	-	-
Set up and operate the welding equipment	24	35	-	-
PC4. compare the thickness of copper wire, filler material and flux required for welding process	2	2	-	-
PC5. set the welding machine, apparatus and accessories appropriately based on the size of cap and load on the machine	3	5	-	-
PC6. install and align the work pieces on the welding apparatus appropriately so that they do not turn or fall down during welding work	3	5	-	-
PC7. add chemicals to work pieces to ensure bonding	2	2	-	-
PC8. program operating instructions into the computers to adjust and start the welding machine	3	4	-	-
PC9. set or adjust the welding parameters as per the job requirements	2	3	-	-
PC10. adjust welding heads and tooling according to work specifications	2	3	-	-
PC11. operate the welding machine as specified in work order and sop to weld the electro tinned copper lead wire to the centre of steel and cap	3	5	-	-





Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC12. unload the completed work pieces from the machine after completion of welding process by using appropriate tools	2	3	-	-
PC13. monitor the welding process and machine constantly to obtain the desired output	2	3	-	-
Check the welding quality	2	5	-	-
PC14. visually inspect the welded workpiece for various quality defects and to ensure conformance to required specifications	1	3	-	-
PC15. repair the workpiece, if needed	1	2	-	-
Undertake preventive maintenance of welding equipment	2	5	-	-
PC16. perform regular cleaning of machine, equipment and work area as prescribed by machine manufacturer	1	3	-	-
PC17. ensure damage and defect-free machine with zero unscheduled downtime	1	2	-	-
Achieve productivity and quality of standards	5	8	-	-
PC18. check the final workpiece completely to avoid rejections	2	3	-	-
PC19. ensure timely delivery of zero defect welded work piece to the next stage	1	2	-	-
PC20. maintain the records and documents related to the outcome of weld performed as per the organisational standards and procedures	2	3	-	-
NOS Total	40	60	-	-





National Occupational Standards (NOS) Parameters

NOS Code	ELE/N0102
NOS Name	Weld the copper lead wire to resistor
Sector	Electronics
Sub-Sector	Semiconductor & Components
Occupation	Production
NSQF Level	3
Credits	TBD
Version	3.0
Last Reviewed Date	27/01/2022
Next Review Date	27/06/2025
NSQC Clearance Date	27/01/2022



ELE/N9972: Communicate and coordinate effectively with others

Description

This unit is about effective, respectful communication and coordination with supervisors and colleagues

Scope

The scope covers the following:

- Communicate effectively with supervisor and colleagues
- Respect gender and ability differences

Elements and Performance Criteria

Communicate effectively with supervisor and colleagues

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

- **PC1.** communicate potential hazards of a particular location
- **PC2.** comply with organisation's policies and procedures for working with colleagues
- **PC3.** maintain personal hygiene and professional appearance
- PC4. seek clarification on the information provided by supervisor, if needed
- **PC5.** respect the personal and professional space of colleagues and superiors
- **PC6.** report work completed as per the schedule to superior and inform of any deviations or anomalies
- **PC7.** analyse and act on feedback received from supervisor

Respect gender and ability differences

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

- PC8. work depicting proper behaviour towards all genders and people with disability
- PC9. identify acts of discrimination and sexual harassment and report to concerned authorities

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1. importance of personal grooming
- KU2. organisation's policy on code of conduct
- KU3. organisation's reporting structure and documentation policy
- KU4. how to communicate effectively through all means including face-to-face, telephonic as well as written
- KU5. different types of information that colleagues might need and the importance of providing the same as and when required
- rights and duties w.r.t PwD at workplace KU6.
- organisation policies and standards to support PwD **KU7.**
- KU8. gender and disability based concepts or issues such as social and cultural bias, gender roles stereotypes, gender inequality and discrimination, especially for women and transgender





organisation grievance redressal mechanisms and related legislations

KU10. health and safety precautions for all individuals, including PwD at workplace

Generic Skills (GS)

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

- **GS1.** listen actively and carefully in all interactions
- **GS2.** communicate politely under all circumstances
- **GS3.** report potential areas of disruptions to work process in writing or in person
- **GS4.** maintain positive and effective relationships with others
- **GS5.** decide when to report to supervisor and when to deal with a colleague depending on the type of concern
- **GS6.** receive and act on supervisor's feedback in a constructive manner
- **GS7.** speak, listen, and write using gender-inclusive or gender-neutral terms and gestures
- GS8. be aware and accountable of ones own gender identity and role, as well as beliefs and practices about disability





Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Communicate effectively with supervisor and colleagues	27	51	-	-
PC1. communicate potential hazards of a particular location	4	7	-	-
PC2. comply with organisation's policies and procedures for working with colleagues	4	7	-	-
PC3. maintain personal hygiene and professional appearance	4	7	-	-
PC4. seek clarification on the information provided by supervisor, if needed	4	8	-	-
PC5. respect the personal and professional space of colleagues and superiors	3	8	-	-
PC6. report work completed as per the schedule to superior and inform of any deviations or anomalies	4	7	-	-
PC7. analyse and act on feedback received from supervisor	4	7	-	-
Respect gender and ability differences	8	14	-	-
PC8. work depicting proper behaviour towards all genders and people with disability	4	7	-	-
PC9. identify acts of discrimination and sexual harassment and report to concerned authorities	4	7	-	-
NOS Total	35	65	-	-





National Occupational Standards (NOS) Parameters

NOS Code	ELE/N9972
NOS Name	Communicate and coordinate effectively with others
Sector	Electronics
Sub-Sector	Generic
Occupation	Generic - Organizational Behaviour
NSQF Level	3
Credits	TBD
Version	2.0
Last Reviewed Date	31/01/2024
Next Review Date	31/01/2027
NSQC Clearance Date	31/01/2024



ELE/N1003: Work effectively, sustainably and safely

Description

This unit is about following health and safety procedures, waste management procedures and resource management in order to achieve required productivity and quality.

Scope

The scope covers the following:

- Achieve optimum productivity and quality
- Implement health and safety procedures
- Organise waste management and recycling
- Conserve resources

Elements and Performance Criteria

Achieve optimum productivity and quality

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

- keep immediate work area clean and tidy PC1.
- PC2. work effectively to meet daily target
- PC3. deliver work of expected quality despite constraints
- PC4. ensure timely completion of tasks
- PC5. comply with organization's policies and procedures

Implement health and safety procedures

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

- take ESD precautions while doing work PC6.
- PC7. avoid any damage in components due to negligence in ESD procedures
- PC8. participate in fire drills or any other safety workshops organised by the organisation
- use appropriate Personal Protective Equipment (PPE) as advised by the organisation

Organise waste management and recycling

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

- **PC10.** identify and segregate recyclable/non-recyclable and hazardous wastes
- **PC11.** dispose waste as per the suggested procedures by the organization
- PC12. participate in waste management and waste disposal workshops organised at workplace

Conserve resources

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

- **PC13.** use all resources judiciously
- **PC14.** perform routine cleaning of tools, machines and equipment
- **PC15.** report malfunctioning of machines and equipment
- PC16. connect electrical equipment and appliances properly when in use and turn off when not in use





Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1. importance of time management
- KU2. organizational safety and health policy
- different waste categories such as dry, wet, recyclable, non-recyclable and single use plastic KU3. items
- KU4. usage of different colours of dustbins to dispose waste
- KU5. cause and effect of greening of jobs
- **KU6.** methods of waste disposal
- KU7. methods of recycling as well as repairing and reusing electronic components
- efficient utilisation of material and water KU8.
- basics of electricity and prevalent energy efficient devices KU9.
- KU10. ways to recognise common electrical problems
- **KU11.** common practices of conserving electricity

Generic Skills (GS)

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

- **GS1.** read job cards/complaint registers for the work requirement
- **GS2.** organise work and be punctual
- GS3. read instructions, warnings, labels on equipment while doing work
- **GS4.** escalate any health and safety issues to supervisors
- **GS5.** report any inappropriate incidents/issues to the relevant person
- **GS6.** write in local/English language and complete written work with attention to detail





Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Achieve optimum productivity and quality	12	18	-	-
PC1. keep immediate work area clean and tidy	2	4	-	-
PC2. work effectively to meet daily target	2	4	-	-
PC3. deliver work of expected quality despite constraints	2	3	-	-
PC4. ensure timely completion of tasks	3	4	-	-
PC5. comply with organization's policies and procedures	3	3	-	-
Implement health and safety procedures	9	14	-	-
PC6. take ESD precautions while doing work	2	4	-	-
PC7. avoid any damage in components due to negligence in ESD procedures	2	3	-	-
PC8. participate in fire drills or any other safety workshops organised by the organisation	2	3	-	-
PC9. use appropriate Personal Protective Equipment (PPE) as advised by the organisation	3	4	-	-
Organise waste management and recycling	8	12	-	-
PC10. identify and segregate recyclable/non-recyclable and hazardous wastes	3	4	-	-
PC11. dispose waste as per the suggested procedures by the organization	2	4	-	-
PC12. participate in waste management and waste disposal workshops organised at workplace	3	4	-	-
Conserve resources	11	16	-	-
PC13. use all resources judiciously	2	4	-	-
PC14. perform routine cleaning of tools, machines and equipment	3	4	-	-





Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC15. report malfunctioning of machines and equipment	3	4	-	-
PC16. connect electrical equipment and appliances properly when in use and turn off when not in use	3	4	-	-
NOS Total	40	60	-	-





National Occupational Standards (NOS) Parameters

NOS Code	ELE/N1003
NOS Name	Work effectively, sustainably and safely
Sector	Electronics
Sub-Sector	Generic
Occupation	Generic - Health Safety
NSQF Level	3
Credits	TBD
Version	2.0
Last Reviewed Date	24/02/2022
Next Review Date	17/11/2025
NSQC Clearance Date	17/11/2022

Assessment Guidelines and Assessment Weightage

Assessment Guidelines

- 1. Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Element/ 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 Element/ 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).
- 5. Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/ training center based on these criteria.
- 6. To pass the Qualification Pack assessment, every trainee should score the Recommended Pass % aggregate for the QP.
- 7. In case of unsuccessful completion, the trainee may seek reassessment on the Qualification Pack.





Minimum Aggregate Passing % at QP Level: 50

(**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/N0102.Weld the copper lead wire to resistor	40	60	-	-	100	60
ELE/N9972.Communicate and coordinate effectively with others	35	65	-	-	100	20
ELE/N1003.Work effectively, sustainably and safely	40	60	-	-	100	20
Total	115	185	-	-	300	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.