

## Qualification Pack



# Stud Welding Operator

QP Code: CSC/Q0210

Version: 2.0

NSQF Level: 4

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## Qualification Pack

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## Qualification Pack

### CSC/Q0210: Stud Welding Operator

#### Brief Job Description

The incumbent in the job roles is responsible for performing stud welding for securing studs and pins to metal surfaces and joining boilers surfaces, insulation, refractories etc. by following organizational standards.

#### Personal Attributes

The job holder must have an eye for detail as well as the patience and discipline required to carry out detailed and repetitive tasks. The candidate should be able to read and understand technical manuals, instructions and warnings.

#### Applicable National Occupational Standards (NOS)

##### Compulsory NOS:

1. [CSC/N1335: Use basic health and safety practices at the workplace](#)
2. [CSC/N1336: Coordinate with co-workers to achieve work efficiency](#)
3. [CSC/N0210: Weld stud joints by stud welding process](#)

#### Qualification Pack (QP) Parameters

Sector	Capital Goods
Sub-Sector	1. Machine Tools 2. Dies, Moulds and Press Tools 3. Plastics Manufacturing Machinery 4. Textile Manufacturing Machinery 5. Process Plant Machinery 6. Electrical and Power Machinery 7. Light Engineering Goods
Occupation	Welding and Cutting
Country	India
NSQF Level	4
Aligned to NCO/ISCO/ISIC Code	NCO-2015/7212.0300

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Minimum Educational Qualification & Experience	10th Class with 2 years of experience in the relevant field Or ITI Welding Or 12th Pass with 6 Months of experience in the relevant field Or Manual/Shielded Metal Arc Welder Level - 3
Minimum Level of Education for Training in School	
Pre-Requisite License or Training	NA
Minimum Job Entry Age	18 Years
Last Reviewed On	
Next Review Date	
Deactivation Date	
NSQC Approval Date	
Version	2.0
Reference code on NQR	
NQR Version	2.0

## Qualification Pack

### CSC/N1335: Follow the health and safety practices at work

#### Description

This OS unit is about following the appropriate health and safety practices at work. It covers responsibilities towards self and others to ensure a safe work environment.

#### Scope

This unit/task covers the following:

- Maintain personal health and safety
- Assist in hazard management
- Check the first aid box, firefighting and safety equipment
- Assist in waste management
- Follow the fire safety guidelines
- Follow the emergency and first-aid procedures
- Carry out relevant documentation and review

#### Elements and Performance Criteria

##### *Maintain personal health and safety*

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

- PC1. follow the recommended practices to ensure protection from infections and transmission to others, such as the use of hand sanitiser and face mask
- PC2. check the work conditions, assess the potential health and safety risks, and take appropriate measures to mitigate them
- PC3. select and use the appropriate Personal Protective Equipment (PPE) relevant to the task and work conditions
- PC4. follow the recommended techniques while lifting and moving heavy objects to avoid injury
- PC5. follow the manufacturer's instructions and workplace safety guidelines while working on heavy machinery, tools and equipment

##### *Assist in hazard management*

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

- PC6. identify existing and potential hazards at work
- PC7. assess the potential risks and injuries associated with the identified hazards
- PC8. coordinate with the supervisor or other relevant personnel to prevent or minimise the identified hazards
- PC9. handle hazardous materials safely and store them in the designated storage

##### *Check the first aid box, firefighting and safety equipment*

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

- PC10. check the first aid box to ensure it is updated with the relevant first aid supplies
- PC11. check and test the firefighting and various safety equipment to ensure they are in usable condition

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PC12. coordinate with the supervisor for the repair and replacement of firefighting and safety equipment

### *Assist in waste management*

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

PC13. segregate waste into appropriate categories

PC14. recycle the recyclable waste appropriately

PC15. dispose of the non-recyclable waste in an environment-friendly manner, complying with the applicable regulations

### *Follow the fire safety guidelines*

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

PC16. use the appropriate type of fire extinguisher to extinguish different types of fires safely

PC17. follow the recommended practices for a safe rescue during a fire emergency

PC18. coordinate with the fire department to request assistance to extinguish a serious fire

### *Follow the emergency and first-aid procedures*

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

PC19. follow the organisational health and safety guidelines during workplace emergencies to ensure own and co-workers' safety

PC20. follow the recommended practices to minimise loss to organisational property during an emergency

PC21. follow the recommended procedure to free a person from electrocution

PC22. administer appropriate first aid to the injured personnel

PC23. perform Cardiopulmonary Resuscitation (CPR) on a potential victim of cardiac arrest

PC24. coordinate with the emergency services to request medical assistance for seriously injured/ ill personnel requiring professional medical attention or hospitalisation

### *Carry out relevant documentation and review*

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

PC25. carry out appropriate documentation following a health and safety incident at work, including all the required information

PC26. coordinate with the relevant personnel to review health and safety conditions at work regularly or following an incident

PC27. assist in implementing appropriate changes to improve the health and safety conditions at work

## Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. the recommended practices to be followed to ensure protection from infections and transmission to others, such as the use of hand sanitiser and face mask

KU2. the importance and process of checking the work conditions, assessing the potential health and safety risks, and take appropriate measures to mitigate them



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- KU3. the importance and process of selecting and using the appropriate PPE relevant to the task and work conditions
- KU4. the recommended techniques to be followed while lifting and moving heavy objects to avoid injury
- KU5. the importance of following the manufacturer's instructions and workplace safety guidelines while working on heavy machinery, tools and equipment
- KU6. the importance and process of identifying existing and potential hazards at work
- KU7. the process of assessing the potential risks and injuries associated with the various hazards
- KU8. how to prevent or minimise different types of hazards
- KU9. how to handle and store hazardous materials safely
- KU10. the importance of ensuring the first aid box is updated with the relevant first aid supplies
- KU11. the process of checking and testing the firefighting and various safety equipment to ensure they are in a usable condition
- KU12. the criteria for segregating waste into appropriate categories
- KU13. the appropriate methods for recycling the recyclable waste
- KU14. the process of disposing of the non-recyclable waste safely and the applicable regulations
- KU15. use of different types of fire extinguishers to extinguish different types of fires
- KU16. the recommended practices to be followed for a safe rescue during a fire emergency
- KU17. how to request assistance from the fire department to extinguish a serious fire
- KU18. the appropriate practices to be followed during workplace emergencies to ensure safety and minimise loss to organisational property
- KU19. common health and safety hazards present in a work environment, associated risks, and how to mitigate them
- KU20. safe working practices to be followed while working at various hazardous sites and using electrical equipment
- KU21. the importance of ensuring easy access to firefighting and safety equipment
- KU22. the appropriate preventative and remedial actions to be taken in the case of exposure to toxic materials, such as poisonous chemicals and gases
- KU23. various causes of fire in different work environments and the recommended precautions to be taken to prevent fire accidents
- KU24. different methods of extinguishing fire
- KU25. different materials used for extinguishing fire, such as sand, water, foam, CO<sub>2</sub>, dry powder, etc.
- KU26. the applicable rescue techniques to be followed during a fire emergency
- KU27. the importance of placing safety signs and instructions at strategic locations in a workplace and following them
- KU28. different types of first aid treatment to be provided for different types of injuries
- KU29. potential injuries associated with incorrect manual handling
- KU30. how to move an injured person safely
- KU31. various hazards associated with the use of various machinery, tools, implements, equipment and materials

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- KU32. the importance of ensuring no obstruction and free access to fire exits
- KU33. how to free a person from electrocution safely
- KU34. how to administer appropriate first aid to an injured person
- KU35. how to perform Cardiopulmonary Resuscitation (CPR)
- KU36. the importance of coordinating with the emergency services to request urgent medical assistance for persons requiring professional medical attention or hospitalisation
- KU37. the appropriate documentation to be carried out following a health and safety incident at work, and the relevant information to be included
- KU38. the importance and process of reviewing the health and safety conditions at work regularly or following an incident
- KU39. the importance and process of implementing appropriate changes to improve the health and safety conditions at work

### Generic Skills (GS)

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

- GS1. maintain work-related notes and records
- GS2. communicate clearly and politely with co-workers and clients
- GS3. read the relevant literature to get the latest updates about the field of work
- GS4. listen attentively to understand the information being shared
- GS5. plan and prioritise tasks to ensure timely completion
- GS6. take quick decisions to deal with workplace emergencies and accidents
- GS7. identify possible disruptions to work and take appropriate preventive measures
- GS8. coordinate with the co-workers to achieve the work objectives
- GS9. evaluate all possible solutions to a problem to select the best one



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### Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Maintain personal health and safety</i>	7	12	-	-
PC1. follow the recommended practices to ensure protection from infections and transmission to others, such as the use of hand sanitiser and face mask	2	3	-	-
PC2. check the work conditions, assess the potential health and safety risks, and take appropriate measures to mitigate them	1	2	-	-
PC3. select and use the appropriate Personal Protective Equipment (PPE) relevant to the task and work conditions	1	2	-	-
PC4. follow the recommended techniques while lifting and moving heavy objects to avoid injury	1	3	-	-
PC5. follow the manufacturer's instructions and workplace safety guidelines while working on heavy machinery, tools and equipment	2	2	-	-
<i>Assist in hazard management</i>	4	10	-	-
PC6. identify existing and potential hazards at work	1	1	-	-
PC7. assess the potential risks and injuries associated with the identified hazards	1	3	-	-
PC8. coordinate with the supervisor or other relevant personnel to prevent or minimise the identified hazards	1	3	-	-
PC9. handle hazardous materials safely and store them in the designated storage	1	3	-	-
<i>Check the first aid box, firefighting and safety equipment</i>	3	7	-	-
PC10. check the first aid box to ensure it is updated with the relevant first aid supplies	1	2	-	-
PC11. check and test the firefighting and various safety equipment to ensure they are in usable condition	1	3	-	-
PC12. coordinate with the supervisor for the repair and replacement of firefighting and safety equipment	1	2	-	-
<i>Assist in waste management</i>	3	8	-	-
PC13. segregate waste into appropriate categories	1	3	-	-

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PC14.recycle the recyclable waste appropriately	1	3	-	-
PC15.dispose of the non-recyclable waste in an environment-friendly manner, complying with the applicable regulations	1	2	-	-
<i>Follow the fire safety guidelines</i>	3	12	-	-
PC16.use the appropriate type of fire extinguisher to extinguish different types of fires safely	1	4	-	-
PC17.follow the recommended practices for a safe rescue during a fire emergency	1	4	-	-
PC18.coordinate with the fire department to request assistance to extinguish a serious fire	1	4	-	-
<i>Follow the emergency and first-aid procedures</i>	7	12	-	-
PC19.follow the organisational health and safety guidelines during workplace emergencies to ensure own and co-workers' safety	1	2	-	-
PC20.follow the recommended practices to minimise loss to organisational property during an emergency	1	3	-	-
PC21.follow the recommended procedure to free a person from electrocution	1	2	-	-
PC22.administer appropriate first aid to the injured personnel	1	2	-	-
PC23.perform Cardiopulmonary Resuscitation (CPR) on a potential victim of cardiac arrest	1	2	-	-
PC24.coordinate with the emergency services to request medical assistance for seriously injured/ ill personnel requiring professional medical attention or hospitalisation	2	1	-	-
<i>Carry out relevant documentation and review</i>	3	9	-	-
PC25.carry out appropriate documentation following a health and safety incident at work, including all the required information	1	3	-	-
PC26.coordinate with the relevant personnel to review health and safety conditions at work regularly or following an incident	1	3	-	-
PC27.assist in implementing appropriate changes to improve the health and safety conditions at work	1	3	-	-
<b>NOS Total</b>	<b>30</b>	<b>70</b>	<b>-</b>	<b>-</b>

## National Occupational Standards (NOS) Parameters

NOS Code	CSC/N1335
NOS Name	Follow the health and safety practices at the work
Sector	Capital Goods
Sub-Sector	Generic
Occupation	Generic
NSQF Level	3
Credits	TBD
Version	2.0
Last Reviewed Date	
Next Review Date	
Deactivation Date	
NSQC Clearance Date	

## Qualification Pack

### CSC/N1336: Coordinate with co-workers to achieve work efficiency

#### Description

This OS unit is about working in coordination with co-workers to achieve the work objectives efficiently. It also covers practising inclusion at work.

#### Scope

This unit/task covers the following:

- Work effectively with co-workers
- Communicate effectively with co-workers
- Practice inclusion at work

#### Elements and Performance Criteria

##### *Work effectively with co-workers*

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

- PC1. plan daily tasks at work to ensure their timely completion and efficient use of time
- PC2. carry out work responsibilities adhering to the limits of authority
- PC3. follow the supervisor's instructions to ensure adherence to the applicable quality standards and timescales
- PC4. coordinate with the co-workers to achieve the work objectives efficiently
- PC5. prepare the relevant documents and reports as per the supervisor's instructions, providing appropriate information clearly and systematically
- PC6. coordinate with the supervisor or relevant personnel to deal with out of authority tasks and concerns
- PC7. mentor and assist subordinates in the execution of their work responsibilities
- PC8. identify possible disruptions to work through coordination with the relevant stakeholders and take appropriate preventive measures
- PC9. use various resources efficiently to ensure maximum utilisation and minimum wastage
- PC10. follow the recommended practices to avoid and resolve conflicts at work
- PC11. follow the relevant organisational policies to ensure disciplined behaviour with maximum productivity at work

##### *Communicate effectively with co-workers*

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

- PC12. follow the organisational policy for the efficient and timely dissemination of information to the authorised personnel
- PC13. communicate clearly and politely to ensure effective communication with co-workers
- PC14. follow the appropriate techniques for active listening during interactions

##### *Practice inclusion at work*

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

- PC15. empathise with Persons with Disabilities (PwD)

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PC16. adopt gender-neutral behaviour at work

### Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1. the importance and process of effective communication in the workplace
- KU2. the barriers to effective communication and how to overcome them
- KU3. the importance of teamwork in an organisation's and individual's success
- KU4. the importance of active listening in the work environment
- KU5. the appropriate techniques to be followed for active listening
- KU6. importance of tone and pitch in effective communication
- KU7. importance of avoiding casual expletives and unpleasant terms while communicating professional circles
- KU8. the importance of maintaining discipline and ethical behaviour at work
- KU9. the common reasons for interpersonal conflict and how to resolve them
- KU10. the importance of developing effective working relationships for professional success
- KU11. how expressing and addressing grievances appropriately and effectively
- KU12. the importance and process of planning daily tasks to ensure their timely completion and efficient use of time
- KU13. the importance of adhering to the limits of authority at work
- KU14. the importance of following the applicable quality standards and timescales at work
- KU15. the importance of coordinating with the co-workers to achieve the work objectives efficiently
- KU16. the relevant documentation requirements
- KU17. the importance of providing appropriate information clearly and systematically in work documents
- KU18. the escalation matrix to be followed to deal with out of authority tasks and concerns
- KU19. the importance and process of mentoring and assisting subordinates in the execution of their work responsibilities
- KU20. how to identify possible disruptions to work prevent them
- KU21. how to use various resources efficiently to ensure maximum utilisation and minimum wastage
- KU22. the recommended practices to be followed at work to avoid and resolve conflicts at work
- KU23. the importance and process of efficient and timely dissemination of information to the authorised personnel
- KU24. how to communicate clearly and politely to ensure effective communication
- KU25. the importance of following the recommended practices to ensure an inclusive environment for PwD and all genders at work



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### Generic Skills (GS)

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

- GS1. maintain work-related notes and records
- GS2. read work-related and other relevant literature
- GS3. communicate politely and -professionally
- GS4. listen attentively to understand the information or instructions being shared
- GS5. plan and prioritise tasks to ensure timely completion
- GS6. take prompt decisions to deal with workplace emergencies and accidents
- GS7. evaluate all possible solutions to a problem to select the best one



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### Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Work effectively with co-workers</i>	20	24	-	-
PC1. plan daily tasks at work to ensure their timely completion and efficient use of time	2	4	-	-
PC2. carry out work responsibilities adhering to the limits of authority	2	4	-	-
PC3. follow the supervisor's instructions to ensure adherence to the applicable quality standards and timescales	2	4	-	-
PC4. coordinate with the co-workers to achieve the work objectives efficiently	2	4	-	-
PC5. prepare the relevant documents and reports as per the supervisor's instructions, providing appropriate information clearly and systematically	2	4	-	-
PC6. coordinate with the supervisor or relevant personnel to deal with out of authority tasks and concerns	2	4	-	-
PC7. mentor and assist subordinates in the execution of their work responsibilities	2	4	-	-
PC8. identify possible disruptions to work through coordination with the relevant stakeholders and take appropriate preventive measures	2	4	-	-
PC9. use various resources efficiently to ensure maximum utilisation and minimum wastage	2	4	-	-
PC10. follow the recommended practices to avoid and resolve conflicts at work	1	4	-	-
PC11. follow the relevant organisational policies to ensure disciplined behaviour with maximum productivity at work	1	3	-	-
<i>Communicate effectively with co-workers</i>	6	15	-	-
PC12. follow the organisational policy for the efficient and timely dissemination of information to the authorised personnel	2	5	-	-
PC13. communicate clearly and politely to ensure effective communication with co-workers	2	5	-	-
PC14. follow the appropriate techniques for active listening during interactions	2	5	-	-
<i>Practice inclusion at work</i>	4	12	-	-



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PC15. empathise with Persons with Disabilities (PWD)	2	6	-	-
PC16. adopt gender-neutral behaviour at work	2	6	-	-
<b>NOS Total</b>	<b>30</b>	<b>70</b>	-	-

## Qualification Pack

# CSC/N0210: Weld stud joints by stud welding process

## Description

This unit is about performing stud welding to secure studs and pins to metal surfaces to attach materials such as boilers, surfaces, insulation and refractories. This can be done through manual processes or with machines in downward position.

## Scope

This unit/task covers the following:

- Prepare for welding operations
- Perform stud welding operations
- Perform post-welding operations

## Elements and Performance Criteria

### *Prepare for welding operations*

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

- PC1. identify the work to be done and maintenance requirements for various equipment/machine parts from the maintenance schedule and complaints received
- PC2. interpret stud welding information from welding procedure data sheets specifications
- PC3. identify the tools, welding machines, measuring instruments, accessories, consumables, different types and sizes of common fasteners and ferrules etc. as per the requirements
- PC4. select and arrange the right equipment, fixtures, accessories, welding gun and consumables as per the SOP and job requirements
- PC5. check the tools and equipment for any defects and they are functioning properly
- PC6. check that base metal plates are as per the required quality standards and approved for stud welding process
- PC7. ensure that welding material surface is appropriately prepared with required surface pre-treatment methods  
**Preparation of surface:** clean; rust free; free from paint, oil, grease, moisture and other contaminants; use abrasives for surface preparation (abrasive wheel, wire brush or wheel, drill burr or end mill)
- PC8. set the stud welding machine and its parameters i.e. cable length size to be equal and return clamp as close to weld point as possible; gun capacity (stud diameter); polarity; stud extension; amperage; time setting; plunge; lift etc. as per the WPS and SOP
- PC9. ensure that supplies of components and consumables are adequate and correctly prepared
- PC10. check that the parent material, components, consumables and joint preparation comply with specifications
- PC11. produce test specimen by welding stud to approved specimen plates and record the information like weld position, nature of base metal and stud surfaces, current, and time for specimen testing as per SOP
- PC12. test the weld specimen through approved tests and record the results as per SOP
- PC13. adjust the parameters of welding machine on the basis of test results to achieve desired

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output and specifications

### *Perform stud welding operations*

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

- PC14. follow safety precautions during welding work as per SOP and organizational guidelines
- PC15. select positions of stud placement on the machine part by looking at specifications, drawing layout or provided templates
- PC16. position, square and level the welding gun to base metal properly before starting the weld
- PC17. perform stud welding on the machine part and stud weld the threaded and unthreaded fasteners accurately by following relevant joining procedure and work instructions
- PC18. perform stud welding of fasteners of different diameters in downward position and produce welded components which meet all the required quality parameters
- PC19. ensure that stud welds are correctly placed and pitched out
- PC20. monitor the process operation and make adjustments to parameters, in order to produce welded components covering different components and different material thicknesses
- PC21. shut down the welding equipment after completion of welding activities

### *Perform post-welding operations*

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

- PC22. check the welded component and ensure that it is meeting the required quality and dimensional accuracy within specified tolerances
- PC23. identify various weld defects by conducting visual inspection, destructive and non-destructive tests on the welded component
- PC24. clean and store all the tools, machine and equipment after completion of work
- PC25. dispose scrap or waste material in accordance with the company policies and environmental regulations
- PC26. check the machine operations for any malfunctions/defects in the component and immediately inform the supervisor/maintenance team for correction
- PC27. report to the supervisor about any problems faced or anticipated during the complete process

## Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1. relevant legislation, standards, policies, and procedures followed in the organization
- KU2. basic principles of stud welding
- KU3. how to extract the information required from the drawings and welding procedure specifications
- KU4. key components and features of the equipment used  
**Key components:** constant current (CC) power source, stud welding gun, weld cable with stud gun control card, control cable, controls for adjusting to diameter, work/ground cable with c clamp type connector
- KU5. types and thicknesses of base metals for welding purposes
- KU6. power sources, types and implications for welding

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- KU7. types and sizes of studs and pins used in stud welding
- KU8. types, components and operation of stud guns for welding  
**Types of guns:** portable, hand-held pistol grip configuration; fixed, production gun, mounted within an automatic fastener loading system  
**Components of gun:** leg screw, chuck adaptor, set screw, ferrule, ferrule grip, foot screws, foot, legs, chuck, plunge
- KU9. types and sizes of ferrules used in stud welding
- KU10. applications of stud welding such as duct work, boilers and bridges
- KU11. how to test stud welding equipment set up for readiness
- KU12. how to adjust stud welding machine as required for achieving specified output
- KU13. importance of levelling and squaring gun to base metal while stud welding
- KU14. importance of holding the gun steady during the weld and not actuating the trigger twice during a stud weld
- KU15. importance of correct plunge and lift in stud welding
- KU16. operation of the stud welding machine controls and their function
- KU17. how to set parameters in stud welding operations to maintain quality; recognition of problems and action to be taken
- KU18. problems that can occur with the welding activities; materials and weld defects and how to rectify them or deal with them appropriately  
**Problems:** misaligned weld, poor weld (missing in large measure), uneven weld, after weld height of the stud not as per requirement, hot weld, cold weld, hang up weld, fillet formation, fillet height, flow or bend of fillet into base material; afterweld length; wetting flash around the stud with no undercut  
types and procedure of destructive and non-destructive methods of testing for assessing weld quality
- KU19. **Non-destructive tests (NDT):** dye penetrant (DPT), fluorescent penetrant (FPT), magnetic particle (MPT)  
**Destructive tests (DT):** Mechanical (tensile test, bend test, torque test)
- KU20. safety requirements during the welding work

### Generic Skills (GS)

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

- GS1. read and interpret drawings, work instructions, equipment manuals and process documents
- GS2. fill up appropriate technical forms, process charts, activity logs as per organizational format in English and/or local language
- GS3. communicate with people in respectful form and manner in line with organizational protocol
- GS4. plan, prioritize and sequence work operations as per job requirements
- GS5. organize and analyse information relevant to work
- GS6. avoid and manage distractions to be disciplined at work
- GS7. manage own time for achieving better results



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- GS8. work in a team in order to achieve better results
- GS9. communicate and cooperate with others in the team for better results
- GS10. seek assistance from fellow team members
- GS11. identify problems with work planning, procedures, output and behaviour and their implications
- GS12. prioritize and plan for problem solving
- GS13. communicate problems appropriately to others
- GS14. identify sources of information and support for problem solving
- GS15. identify effective resolution techniques
- GS16. undertake and express new ideas and initiatives to others
- GS17. enhance ones competencies in new and different situations and contexts to achieve more
- GS18. seek to improve and modify own work practices



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### Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Prepare for welding operations</i>	17	24	-	11
PC1. identify the work to be done and maintenance requirements for various equipment/machine parts from the maintenance schedule and complaints received	1	2	-	-
PC2. interpret stud welding information from welding procedure data sheets specifications	1	2	-	1
PC3. identify the tools, welding machines, measuring instruments, accessories, consumables, different types and sizes of common fasteners and ferrules etc. as per the requirements	3	2	-	2
PC4. select and arrange the right equipment, fixtures, accessories, welding gun and consumables as per the SOP and job requirements	1	2	-	2
PC5. check the tools and equipment for any defects and they are functioning properly	1	2	-	1
PC6. check that base metal plates are as per the required quality standards and approved for stud welding process	1	1	-	-
PC7. ensure that welding material surface is appropriately prepared with required surface pre- treatment methods  <b>Preparation of surface:</b> clean; rust free; free from paint, oil, grease, moisture and other contaminants; use abrasives for surface preparation (abrasive wheel, wire brush or wheel, drill burr or end mill)	2	3	-	1
PC8. set the stud welding machine and its parameters i.e. cable length size to be equal and return clamp as close to weld point as possible; gun capacity (stud diameter); polarity; stud extension; amperage; time setting; plunge; lift etc. as per the WPS and SOP	2	3	-	2
PC9. ensure that supplies of components and consumables are adequate and correctly prepared	1	1	-	-
PC10. check that the parent material, components, consumables and joint preparation comply with	1	1	-	-

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specifications				
PC11. produce test specimen by welding stud to approved specimen plates and record the information like weld position, nature of base metal and stud surfaces, current, and time for specimen testing as per SOP	1	2	-	1
PC12. test the weld specimen through approved tests and record the results as per SOP	1	2	-	1
PC13. adjust the parameters of welding machine on the basis of test results to achieve desired output and specifications	1	1	-	-
<i>Perform stud welding operations</i>	<b>8</b>	<b>16</b>	-	<b>5</b>
PC14. follow safety precautions during welding work as per SOP and organizational guidelines	1	1	-	-
PC15. select positions of stud placement on the machine part by looking at specifications, drawing layout or provided templates	1	1	-	-
PC16. position, square and level the welding gun to base metal properly before starting the weld	1	2	-	1
PC17. perform stud welding on the machine part and stud weld the threaded and unthreaded fasteners accurately by following relevant joining procedure and work instructions	2	4	-	1
PC18. perform stud welding of fasteners of different diameters in downward position and produce welded components which meet all the required quality parameters	2	4	-	2
PC19. ensure that stud welds are correctly placed and pitched out	-	1	-	-
PC20. monitor the process operation and make adjustments to parameters, in order to produce welded components covering different components and different material thicknesses	1	2	-	1
PC21. shut down the welding equipment after completion of welding activities	-	1	-	-
<i>Perform post-welding operations</i>	<b>5</b>	<b>10</b>	-	<b>4</b>
PC22. check the welded component and ensure that it is meeting the required quality and dimensional accuracy within specified tolerances	1	2	-	1
PC23. identify various weld defects by conducting visual inspection, destructive and non-destructive tests on the welded component	2	3	-	2

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PC24. clean and store all the tools, machine and equipment after completion of work	1	1	-	-
PC25. dispose scrap or waste material in accordance with the company policies and environmental regulations	-	1	-	-
PC26. check the machine operations for any malfunctions/defects in the component and immediately inform the supervisor/ maintenance team for correction	1	2	-	1
PC27. report to the supervisor about any problems faced or anticipated during the complete process	-	1	-	-
<b>NOS Total</b>	<b>30</b>	<b>50</b>	<b>-</b>	<b>20</b>

## Qualification Pack

### National Occupational Standards (NOS) Parameters

<b>NOS Code</b>	CSC/N0210
<b>NOS Name</b>	Weld stud joints by stud welding process
<b>Sector</b>	Capital Goods
<b>Sub-Sector</b>	<ol style="list-style-type: none"> <li>1. Machine Tools</li> <li>2. Dies, Moulds and Press Tools</li> <li>3. Plastics Manufacturing Machinery</li> <li>4. Textile Manufacturing Machinery</li> <li>5. Process Plant Machinery</li> <li>6. Electrical and Power Machinery</li> <li>7. Light Engineering Goods</li> </ol>
<b>Occupation</b>	Welding and Cutting
<b>NSQF Level</b>	4
<b>Credits</b>	TBD
<b>Version</b>	2.0
<b>Last Reviewed Date</b>	
<b>Next Review Date</b>	
<b>NSQC Clearance Date</b>	

## Qualification Pack

### Assessment Guidelines and Assessment Weightage

#### Assessment Guidelines

1. Criteria for assessment for the Qualification Pack will be created by CGSC.
2. Performance Criteria (PC) have been assigned marks proportional to its importance in NOS. SSC will also lay down proportion of marks for Theory and Skills Practical for each PC.
3. The assessment for the theory part will/may be based on knowledge bank of questions approved CGSC.
4. Assessment will be conducted for all compulsory NOS, and where applicable, on the selected elective/option NOS/set of NOS.
5. Assessment Agencies will create Assessor Guides comprising of Theory and Practical Assessment Set and Guidelines for each examination/training centre (as per assessment criteria below). The same will be approved by CGSC for adequacy.
6. To successfully attain Certification on the Qualification Pack, the trainee must score a minimum of 70% in each Core NOS and minimum of 50% in all non-core NOS. In addition, a candidate needs to attain a minimum overall pass percentage of 70% for certification.
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
CSC/N1335. Use basic health and safety practices at the workplace	30	70	-	-	100	15
CSC/N1336. Coordinate with co-workers to achieve work efficiency	30	70	-	-	100	15
CSC/N0210. Weld stud joints by stud welding process	30	50	-	20	100	70
<b>Total</b>	<b>90</b>	<b>190</b>	<b>-</b>	<b>20</b>	<b>300</b>	<b>100</b>

## Qualification Pack

### Acronyms

NOS	National Occupational Standard(s)
NSQF	National Skills Qualifications Framework
QP	Qualifications Pack
TVET	Technical and Vocational Education and Training
NDT	Non-Destructive Testing
DT	Destructive Testing
CO <sub>2</sub>	Carbon Dioxide
CPR	Cardiac Pulmonary Resuscitation
WPS	Welding Procedure Speciation
PPE	Personal Protective Equipment
CC	Constant Current



## Qualification Pack

### Glossary

<b>Sector</b>	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.
<b>Sub-sector</b>	Sub-sector is derived from a further breakdown based on the characteristics and interests of its components.
<b>Occupation</b>	Occupation is a set of job roles, which perform similar/ related set of functions in an industry.
<b>Job role</b>	Job role defines a unique set of functions that together form a unique employment opportunity in an organisation.
<b>Occupational Standards (OS)</b>	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.
<b>Performance Criteria (PC)</b>	Performance Criteria (PC) are statements that together specify the standard of performance required when carrying out a task.
<b>National Occupational Standards (NOS)</b>	NOS are occupational standards which apply uniquely in the Indian context.
<b>Qualifications Pack (QP)</b>	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.
<b>Unit Code</b>	Unit code is a unique identifier for an Occupational Standard, which is denoted by an 'N'
<b>Unit Title</b>	Unit title gives a clear overall statement about what the incumbent should be able to do.
<b>Description</b>	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.
<b>Scope</b>	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.

## Qualification Pack

<b>Knowledge and Understanding (KU)</b>	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.
<b>Organisational Context</b>	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.
<b>Technical Knowledge</b>	Technical knowledge is the specific knowledge needed to accomplish specific designated responsibilities.
<b>Core Skills/ Generic Skills (GS)</b>	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.
<b>Electives</b>	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.
<b>Options</b>	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.