

Revision made by NSDA\_25 May 2015

## **QUALIFICATION FILE – CONTACT DETAILS OF SUBMITTING BODY**

### **Name and address of submitting body:**

**Capital Goods Skills Council**

**FICCI, Federation House, 1 Tansen Marg, New Delhi 110001**

### **Name and contact details of individual dealing with the submission**

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### **List of documents submitted in support of the Qualifications File**

1. Qualification Pack
2. RFP for development of Occupational Standards
3. Selection process of the Consultants to develop Occupational Standards
4. CGSC Protocol for Accreditation of Assessment Agencies and Assessment Framework
5. Sample of Assessors Guide
6. Minutes of the meeting of GC meetings
  - i. Composition of the Technical Committee
  - ii. Approval of Occupational Standards by Technical Committee and Governing Council
7. NSDC Human Resource & Skills Requirement in Capital Goods Sector is  
[http://cgsc.in/Humanresource\\_skill\\_requirement.pdf](http://cgsc.in/Humanresource_skill_requirement.pdf)
8. Occupational Map & Progression matrix
9. Draft MoU with Industry
10. List of companies and Industry associations participated in the development of these qualification packs (part of report)
11. List of QP/NOS validating companies.

## QUALIFICATION FILE SUMMARY

<b>Qualification Title</b>	Assistant Tungsten Inert Gas Welder (GTAW)		
<b>Body/bodies which will assess candidates</b>	<ul style="list-style-type: none"> <li>• Manipal City &amp; Guilds</li> <li>• Multi Skills Assessors Guild</li> <li>• Indian Institute of Welding</li> </ul>		
<b>Body/bodies which will award the certificate for the qualification.</b>	Capital Goods Skills Council		
<b>Body which will accredit providers to offer the qualification.</b>	Capital Goods Skills Council		
<b>Occupation(s) to which the qualification gives access</b>	Welding and Cutting		
<b>Proposed level of the qualification in the NSQF.</b>	4		
<b>Anticipated volume of training/learning required to complete the qualification.</b>	300 hours		
<b>Entry requirements / recommendations.</b>	10 <sup>th</sup> Standard		
<b>Progression from the qualification.</b>	Tungsten Inert Gas Welder (GTAW) Welder		
<b>Planned arrangements for RPL.</b>	RPL arrangements and policies are under development. The guidelines should be ready in 2-3 months.		
<b>International Comparability</b>	UK: SEMPEO1-16  Australian: AURVTW2004		
<b>Formal structure of the qualification</b>			
<b>Title of unit or other component</b> (include any identification code used)	<b>Mandatory/ Optional</b>	<b>Estimated size (learning hours)</b>	<b>Level</b>
CSC/ N 0212 (Perform basic Tungsten Inert Gas (TIG) Welding also known as Gas Tungsten Arc Welding (GTAW) Welding)	Mandatory	140	4
CSC/ N 1335 (Use basic health and safety practices at the workplace)	Mandatory	80	Common across 1-4 levels
CSC/ N 1336 (Work effectively with others)	Mandatory	80	Common across 1-4 levels

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

Give details of the document here:

- Qualification Pack is attached as Annexure 1

## **SECTION 1**

### **ASSESSMENT**

#### **Name of assessment body:**

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

- Manipal City & Guilds
- Multi Skills Assessors Guild
- Indian Institute of Welding

#### **Will the assessment body be responsible for RPL assessment?**

Yes

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

RPL will be based on the same approved Qualification Pack and Assessment Criteria mentioned in the Qualification Pack.

The process of RPL assessment is under development.

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

The emphasis is on 'learning-by-doing' and practical demonstration of skills and knowledge based on the performance criteria. The assessment papers are developed by Subject Matter Experts (SME) available with the Assessment Agency as per the performance and assessment criteria mentioned in the Qualification Pack. The assessments papers are also checked for the various outcome based parameters such as quality, time taken, precision, tools & equipment requirement etc. The assessment sets are then reviewed by CGSC official for consistency. The assessments are designed so as to assess maximum parts during the practical hands on work. The technical limitations at the training centres are taken care in theory and viva. Criteria such as use of lift to pick heavy objects or selection of fire extinguisher during a fire are also assessed under theory/viva.

The assessment agencies are instructed to hire assessors with integrity, reliability and fairness. Each assessor shall sign a document with its assessment agency by which they commit themselves to comply with the rules of confidentiality and conflict of interest, independence from commercial and other interests that would compromise impartiality of the assessments. The assessment agencies are instructed to Ideally have assessor with minimum 15 years industry experience as an ITI graduate / minimum 10 years' industry experience as diploma engineer and minimum 5 years' industry experience as graduate engineer.

The assessors selected by Assessment Agencies are scrutinized and made to undergo training and introduction to CGSC Assessment Framework, competency based assessments, assessors guide etc.

The assessors are provided with assessors guide developed by the Subject Matter Expert of the assessment agency as per the assessment framework. The assessment guides are developed to ensure the maximum possible consistency in the assessment by different assessors and elaborate on the following

- 1 Qualification Pack Structure
- 2 Guidance for the assessor to conduct theory, practical and viva assessments
- 3 Guidance for trainees to be given by assessor before the start of the assessments.
- 4 Guidance on assessments process, practical brief with steps of operations practical observation checklist and mark sheet
- 5 Viva guidance for uniformity and consistency across the batch.
- 6 Guidance on assessment evidence collection

A sample format of Assessment Guide for Fitter-Fabrication is attached. Similar Assessor Guides are developed and shared with the assessors before the start of the assessments as standard practices for all assessments by CGSC. The Sample of Assessor Guide is attached as Annexure 4

The assessment results are backed by evidences collected by assessors.

- 1 The assessor needs to collect a copy of the attendance for the training done under the scheme. The attendance sheets are signed and stamped by the In charge /Head of the Training Centre.
- 2 The assessor needs to verify the authenticity of the candidate by checking the photo ID card issued by the institute as well as any one Photo ID card issued by the Central/Government. The same needs to be mentioned in the attendance sheet. In case of suspicion, the assessor should authenticate and cross verify trainee's credentials in the enrolment form.
- 3 The assessor needs to punch the trainee's roll number on all the test pieces. Different sections can have alpha numbering. For example a student roll number is 123 then the three pieces can be numbered and punched as 123a, 123b and 123c.
- 4 The assessor needs to take a photograph of all the students along with the assessor standing in the middle and with the centre name/banner at the back as evidence.
- 5 The assessor needs to carry a camera to click photograph of the trainees working on the job and giving theory exam as evidence.
- 6 The assessor also needs to carry a photo ID card.
- 7 The assessor also needs to take the photographs as evidence from appropriate angles/sides of the final work piece/job submitted by the trainee. This evidence is signed by the trainee at the time of submission of the job piece.
- 8 The assessor needs to measure the dimensions and finish of the submitted job piece as per the tolerance or standards mentioned in the assessment guide.

The assessment agencies are instructed to hire assessors with integrity, reliability and fairness. Each assessor shall sign a document with its assessment agency by which they commit themselves to comply with the rules of confidentiality and conflict of interest, independence from commercial and other interests that would compromise impartiality of the assessments. The assessment agencies are instructed to Ideally have assessor with minimum 15 years industry experience as an ITI graduate / minimum 10 years' industry experience as diploma engineer and minimum 5 years' industry experience as graduate engineer.

The details on assessment framework are elaborated in CGSC Protocol for Accreditation of Assessment Agencies and Assessment Framework.

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

Give details of the document(s) here:

- CGSC Protocol for Accreditation of Assessment Agencies and Assessment Framework.
- Sample of Assessors Guide

## ASSESSMENT EVIDENCE

Complete the following grid for each grouping of NOS, assessment unit or other component as per the assessment criteria. Insert the required number of rows.

**CRITERIA FOR ASSESSMENT OF TRAINEES**

**Job Role : Assistant Tungsten Inert Gas Welder (GTAW)**

**Qualification Pack : CSC/ Q 0212**

**Sector Skill Council : Capital Goods sector skill Council**

**Guidelines for Assessment:**

1. Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Performance Criteria (PC) will be assigned marks proportional to its importance in NOS. SSC will also lay down proportion of marks for Theory and Skills Practical for each PC.
2. The assessment for the theory part will be based on knowledge bank of questions created by the SSC.
3. Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training center (as per assessment criteria below)
4. Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/training center based on this criteria
5. To pass the Qualification Pack , every trainee should score a minimum of 70% in every NOS
6. In case of successfully passing only certain number of NOS's, the trainee is eligible to take subsequent assessment on the balance NOS's to pass the Qualification Pack.

<b>Assessable Outcomes</b>	<b>Assessment Criteria</b>	<b>Total Marks</b>	<b>Out of</b>	<b>Theory</b>	<b>Skills Practical</b>
<b>CSC/ N 0212: Perform basic manual Tungsten Inert Gas (TIG) Welding also known as Gas Tungsten Arc Welding (GTAW) welding</b>	PC1. work safely at all times, complying with health and safety legislation, regulations and other relevant guidelines	<b>100</b>	3	1	2
	PC2. take necessary safety precautions for TIG welding operations		2	0	2
	PC3. interpret weld procedure data sheets specifications		3	1	2
	PC4. check that all measuring equipment is within calibration date		2	0	2
	PC5. check if welding machines eg. transformer, inverters (AC/DC), rectifiers and generators have been made available by the authorized person		2	1	1
	PC6. check if welding torch, tungsten electrode and filler wire have been made available by the authorized person		2	1	1
	PC7. prepare for the TIG welding process		2	1	1
	PC8. prepare the materials and joint in readiness for welding		2	0	2
	PC9. fit the welding shielding gases given by the authorised person, for a range of given applications		2	0	2

PC10. plan the welding activities before they start them effectively and efficiently for achieving specifications as per WPS	2	0	2
PC11. connect torches and the components	2	0	2
PC12. connect and adjust regulators and flow meters to cylinders	3	1	2
PC13. read, set and adjust current (amperage) as required	3	1	2
PC14. set pre-purge with shielding gas as required	2	1	1
PC15. prepare tungsten by sharpening or balling it to desired tip shape	3	1	2
PC16. set and verify gas flow rates	2	1	1
PC17. prepare and support the joint, using the appropriate methods	3	1	2
PC18. tack weld the joint at appropriate intervals, and check the joint for accuracy before final welding	2	0	2
PC19. match feed and travel speed as required	2	0	2
PC20. perform TIG welding operations using appropriate welding techniques to meet welding procedure specification requirements	5	1	4
PC21. use correct technique for starting the arc (using HF (high frequency) unit, scratching the electrode on the job material, lifting the electrode immediately after touching the job material)	4	2	2
PC22. use correct angle of torch and filler wire	4	1	3
PC23. weld the joint to the specified quality, dimensions and profile	4	1	3
PC24. use manual welding and related equipment, to carry out TIG welding processes	4	1	3
PC25. produce joints of the required quality and of specified dimensional accuracy which achieve a weld quality equivalent to Level B of ISO 5817	4	1	3
PC26. use both methods to produce the various joints a) with filler wire b) without filler wire (autogenously)	4	2	2
PC27. produce joints from various materials in different forms	2	0	2
PC28. weld joints in good access situations, in select positions	3	1	2
PC29. make sure that the work area is maintained and left in a safe and tidy	2	0	2

	condition				
	PC30. use appropriate methods and equipment to check the quality, and that all dimensional and geometrical aspects of the weld are to the specification		4	2	2
	PC31. check that the welded joint conforms to the specification, by checking various quality parameters using visual inspection		3	1	2
	PC32. identify various weld defects		3	1	2
	PC33. detect surface imperfections and deal with them appropriately		2	1	1
	PC34. report any defect or imperfection identified to the authorised person		2	0	2
	PC35. shut down and make safe the welding equipment on completion of the welding activities		2	0	2
	PC36. detect equipment malfunctions and deal with them appropriately		2	0	2
	PC37. deal promptly and effectively with problems within their control, and seek help and guidance from the relevant people if they have problems that they cannot resolve		2	0	2
		<b>Total</b>	<b>100</b>	<b>26</b>	<b>74</b>
<b>CSC/ N 1335: Use basic health and safety practices at the workplace</b>	PC1. use protective clothing/equipment for specific tasks and work conditions	<b>100</b>	5	2	3
	PC2. state the name and location of people responsible for health and safety in the workplace		3	1	2
	PC3. state the names and location of documents that refer to health and safety in the workplace		3	1	2
	PC4. identify job-site hazardous work and state possible causes of risk or accident in the workplace		5	2	3
	PC5. carry out safe working practices while dealing with hazards to ensure the safety of self and others state methods of accident prevention in the work environment of the job role		4	2	2
	PC6. state location of general health and safety equipment in the workplace		3	2	1
	PC7. inspect for faults, set up and safely use steps and ladders in general use		5	2	3
	PC8. work safely in and around trenches, elevated places and confined areas		5	2	3
	PC9. lift heavy objects safely using correct procedures		5	2	3

	PC10. apply good housekeeping practices at all times		4	2	2
	PC11. identify common hazard signs displayed in various areas		5	2	3
	PC12. retrieve and/or point out documents that refer to health and safety in the workplace		3	1	2
	PC13. use the various appropriate fire extinguishers on different types of fires correctly		4	1	3
	PC14. demonstrate rescue techniques applied during fire hazard		4	1	3
	PC15. demonstrate good housekeeping in order to prevent fire hazards		3	1	2
	PC16. demonstrate the correct use of a fire extinguisher		4	1	3
	PC17. demonstrate how to free a person from electrocution		4	1	3
	PC18. administer appropriate first aid to victims where required eg. in case of bleeding, burns, choking, electric shock, poisoning etc.		4	1	3
	PC19. demonstrate basic techniques of bandaging		3	1	2
	PC20. respond promptly and appropriately to an accident situation or medical emergency in real or simulated environments		4	1	3
	PC21. perform and organize loss minimization or rescue activity during an accident in real or simulated environments		3	1	2
	PC22. administer first aid to victims in case of a heart attack or cardiac arrest due to electric shock, before the arrival of emergency services in real or simulated cases		3	1	2
	PC23. demonstrate the artificial respiration and the CPR Process		3	1	2
	PC24. participate in emergency procedures		3	2	1
	PC25. complete a written accident/incident report or dictate a report to another person, and send report to person responsible		4	1	3
	PC26. demonstrate correct method to move injured people and others during an emergency		4	1	3
		<b>Total</b>	<b>100</b>	<b>36</b>	<b>64</b>
<b>CSC/ N 1336: Work effectively</b>	PC1. accurately receive information and instructions from the supervisor and fellow workers, getting clarification where required	<b>100</b>	10	3	7



<b>with others</b>	PC2. accurately pass on information to authorized persons who require it and within agreed timescale and confirm its receipt		10	3	7
	PC3. give information to others clearly, at a pace and in a manner that helps them to understand		10	3	7
	PC4. display helpful behavior by assisting others in performing tasks in a positive manner, where required and possible		10	3	7
	PC5. consult with and assist others to maximize effectiveness and efficiency in carrying out tasks		10	3	7
	PC6. display appropriate communication etiquette while working		10	3	7
	PC7. display active listening skills while interacting with others at work		10	3	7
	PC8. use appropriate tone, pitch and language to convey politeness, assertiveness, care and professionalism		10	3	7
	PC9. demonstrate responsible and disciplined behaviors at the workplace		10	3	7
	PC10. escalate grievances and problems to appropriate authority as per procedure to resolve them and avoid conflict		10	3	7
		<b>Total</b>	<b>100</b>	<b>30</b>	<b>70</b>

## **SECTION 2**

### **EVIDENCE OF NEED**

#### **What evidence is there that the qualification is needed?**

While collecting data from the companies for the occupational map, we also took feedback from industry, which was collected with respect to roles for which qualification packs development, was to be prioritized. This was largely based on volume of people required, quantitative and qualitative shortfall which the Industry feels they face. Governing council of CGSC gave final approval and endorsement for the same.

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

Skills Gap analysis Reports for industry demand and secondary research data, though these do not lend to accurate demand projection. The link to NSDC Human Resource & Skills Requirement in Capital Goods Sector is [http://cgsc.in/Humanresource\\_skill\\_requirement.pdf](http://cgsc.in/Humanresource_skill_requirement.pdf)

- Feedback from industry for demand though again sample size may not lend to accurate figures
- Training duration, and current and potential training capacity envisaged

An LMIS development initiative is being put in place to be more precise regarding the demand and supply

#### **What steps were taken to ensure that the qualification(s) does/do not duplicate already existing or**

**planned qualifications in the NSQF?**

- NSDC list of Approved and Under-Development QPs was checked prior to commissioning the work
- NSDC QRC team also confirmed the same

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

- Agencies have been appointed by the SSC to interact with training providers to gather feedback in implementation.
- Monitoring of results of assessments
- Employer feedback will be sought post-placement
- A formal review is scheduled in two year time

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

Give details of the document(s) here:

- Report to the Governing Council
- Minutes of the meeting of GC meetings
- NSDC Human Resource & Skills Requirement in Capital Goods Sector

**SECTION 3****SUMMARY OF DIRECT EVIDENCE OF LEVEL**

Justify the NSQF level allocated to the QP. Relate information about the job role and build upon the five descriptors for the level to justify.

Fire Safety, Emergencies and rescue, First Aid and Work effectively are common for all roles from NSQF levels 2-4 and cover the minimum requirement in terms of health, safety and working effectively with others in a workplace. Level 4

<b>Qualification Title and Classification Code- Assistant Tungsten Inert Gas Welder (GTAW) CSC/ Q 0212</b>					
<b>Process required</b>	<b>Professional knowledge</b>	<b>Professional skill</b>	<b>Core skill</b>	<b>Responsibility</b>	<b>Level</b>
Assistant Tungsten Inert Gas Welder (GTAW) perform basic manual operations for performing tungsten inert arc welding	Assistant Tungsten Inert Gas Welder (GTAW) must have knowledge of welding on different materials (carbon steel, low alloy steel) and knowledge of welding in various welding	Assistant Tungsten Inert Gas Welder should have skills to perform basic manual TIG (GTAW) welding for a range of standard welding job requirements. This involves welding different materials (carbon steel, low alloy steel) in	Assistant TIG welder must have good communication, numerical and computational abilities.  Must be able to undertake numerical operations, geometry and	Assistant Tungsten Inert Gas Welder plans and organize own work. Identifies and solve problems in the course of working.  Assistant	4

<p>(GTAW) also known as gas tungsten arc welding (GTAW) and carry out TIG (GTAW) weld operations independently for welding joints in basic positions as per welding procedure specification (WPS).</p>	<p>positions such as flat (PA) IG/1F, horizontal vertical (PB) 2F, horizontal (PC) 2G, vertical upwards (PF) 3F / 3G, vertical downwards (PG) 3F / 3G etc.</p> <p>Must have knowledge of preparation of various joints including corner, fillet and tee etc. Setting, preparation and operation of the equipment, materials and interpretation of terminologies, WPS etc.</p> <p>Knowledge to check that the welded joint conforms to the specification such as quality parameters using visual inspection.</p>	<p>various positions. The welder can prepare various joints including corner, fillet and tee.</p> <p>Must be able to interpret WPS and terminology, prepare the materials and joint in readiness for welding, able to use correct technique for starting the arc using HF (high frequency) unit.</p> <p>Able to produce joints from various materials such as carbon steel, low alloy steel sheet (less than 1.5 mm), plate (8 mm), pipe /tube in different forms.</p> <p>Able to check that the welded joint conforms to the specification, by checking various quality parameters using visual inspection</p> <p>Must be able to work effectively with others and as per specified reference procedures.</p>	<p>calculations/ formulae (including percentages and proportions, simple ratios and averages), use appropriate measuring techniques, convert imperial and metric systems of measurements, apply appropriate degree of accuracy, tolerances, types of reference lines and work points, select and use tools and equipment such as measuring tapes, levels, squares, protractors and dividers etc..</p> <p>Must have good motor coordination, openness to learning, ability to plan and organize own work and identify and solve problems in the course of working as per specifications.</p> <p>The standard procedure for equipment could</p>	<p>Tungsten Inert Gas Welder is expected to work with a minimum of supervision, taking personal responsibility for own actions and for the quality and accuracy of the work.</p>	
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			be in local or English language.		
Level: 4	Level: 4	Level: 4	Level: 4	Level: 4	

**OTHER EVIDENCE OF LEVEL** [This need only be filled in where evidence other than primary outcomes was used to allocate a level] (**Optional**)

Summary of other evidence (if used):

nil

## **SECTION 4**

### **EVIDENCE OF RECOGNITION OR PROGRESSION**

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

- Horizontal and vertical mobility options have been articulated.
- Vertical: Tungsten Inert Gas Welder
- Horizontal: Gas Metal Arc Welder
- Cross sectoral mobility includes welder for Power, Construction, Iron and steel and other manufacturing sectors in similar roles

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

Give details of the document(s) here:

- Occupational Map and progression matrix
- Draft MoU
- List of companies and Industry associations participated in developed of these qualifications (part of report)