**NSDA Reference**

*To be added by NSDA*

**CONTACT DETAILS OF THE BODY SUBMITTING THE QUALIFICATION FILE**

**Name and address of submitting body:**

West Bengal State Council of Technical & Vocational Education and Skill Development

Karigari Bhavan(5th Floor), Plot-B/7, Action Area-III

New Town, Kolkata-700160

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

**Name: SUPARNA KUMAR ROYCHOWDHURY**

**Position in the organisation: Chairman, Board of Studies and Skilling**

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

1. Curriculum and Course Content
2. MoM with Industries/ Employers to establish need of the qualification
3. Assessment strategy

**SUMMARY**

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| --- | --- | --- | --- | --- |
| **Qualification Title** | **Welder** | | | |
| **Qualification Code** |  | | | |
| **Nature and purpose of the qualification** | Short term Certificate Course  To become self-employed i.e. entrepreneurs or wage employed | | | |
| **Body/bodies which will award the qualification** | West Bengal State Council of Technical & Vocational Education and Skill Development | | | |
| **Body which will accredit providers to offer courses leading to the qualification** | Committee on Recognition under the West Bengal State Council of Technical & Vocational Education and Skill Development | | | |
| **Body/bodies which will carry out assessment of learners** | Board of Examination under the West Bengal State Council of Technical & Vocational Education and Skill Development | | | |
| **Occupation(s) to which the qualification gives access** | Welder | | | |
| **Licensing requirements** | NA | | | |
| **Level of the qualification in the NSQF** | Level 3 | | | |
| **Anticipated volume of training/learning required to complete the qualification** | 650 hours | | | |
| **Entry requirements and/or recommendations** | Class VIII pass | | | |
| **Progression from the qualification** | Jr. Welder ----.Welder----Sr.Welder | | | |
| **Planned arrangements for the Recognition of Prior learning (RPL)** | RPL will consist of four stages   1. Counselling- To inform, advise and guide the candidates regarding RPL 2. Pre-Assessment- To assess the current competencies of the candidates and identifying the gap between the full qualification and current competencies. 3. Orientation &Bridge Training- To train the candidates for bridging the gap. 4. Final assessment & Certification- To assess the candidate for full qualification and certify. | | | |
| **International comparability where known** | N/A | | | |
| **Date of planned review of the qualification.** | Every 3 years(Next Feb 2021) | | | |
| **Formal structure of the qualification**  After completion of course the passed out trainee can work as Junior Welder and after two years of field experience the passed out trainee can work as Welder and after that with appropriate experience, the person can work as a Senior Welder. | | | | |
| Title of component and identification code. | | Mandatory/ Optional | Estimated size (learning hours) | Level |
| Apply safe working Practices | | Mandatory | 25 | 3 |
| Understand electricity and its use in welding | | Mandatory | 25 | 3 |
| Understand arc formation and its characteristics and also principles of arc welding | | Mandatory | 25 | 3 |
| Demonstrate different types of electrodes, their symbols, welding symbols, edge preparation | | Mandatory | 25 | 3 |
| Demonstrate different types of weld joins with neat and appropriate sketch. | | Mandatory | 25 | 3 |
| Know different motions involving deposition and number of pass | | Mandatory | 25 | 3 |
| Perform arc welding in different joint of two plates having different thicknesses | | Mandatory | 175 | 3 |
| Apply different passes according to requirement and perform weaving | | Mandatory | 50 | 3 |
| Understand principles of gas welding and distinguish different types of flame. | | Mandatory | 50 | 3 |
| Perform gas welding | | Mandatory | 125 | 3 |
| Test and recognise various defect of weldingfor plates and pipes. | | Mandatory | 25 | 3 |
| Understand and practice soft skills | | Mandatory | 25 | 3 |
| Demonstrate knowledge of concept and principles of basic arithmetic and financial calculation, and apply knowledge of specific area to perform practical operations. | | Mandatory | 25 | 3 |
| Explain time management, entrepreneurship and manage/organize related task in day to day work for personal & social growth. | | Mandatory | 25 | 3 |

| **Title of component and identification code.** | **Mandatory/Optional** | **Estimated size (learning hours)** | **Level** |
| --- | --- | --- | --- |
| **I. Theory**  **Theory component of the course is to develop relevant basic technical information & knowledge about electrical arc welding and gas welding processes along withthe machines, different deposition techniques, defects, advantages and disadvantages.**  **II. Practical**   1. **Institutional component of Practical training of the course is to impart relevant basic technical skills to perform arc welding as well as gas welding process in different types of joints between plates having different thickness.** 2. **Apprenticeship component of Practical training of the course is to develop competency in the real job situation with special emphasis on defect-less, sound and as per drawing.**   **III. Employability Skills**  **Employability Skills component of the course is to impart Soft skills which include Communication Skills, Behaviour, IT literacy, Entrepreneurship Skills, Safety, Hygiene etc.** | **Mandatory**  **Mandatory**  **Mandatory**  **Mandatory** | **100**  **300**  **150**  **100** | **3**  **3**  **3**  **3** |
| **Total (I+II+III)** |  | **650** |  |

1. Curriculum Document is attached in Annexure-1.
2. Assessment Strategy Component wise distribution of marks is given in the Annexure No. 2
3. Industry Validation

**SECTION 1**

**ASSESSMENT**

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| **Body/Bodies which will carry out assessment:**  Board of Examination under West Bengal State Council of Technical & Vocational Education & Skill Development, constituted under the ACT XXVI of 2013 under Department of Technical Education, Training & Skill Development, Govt. of West Bengal  **How will RPL assessment be managed and who will carry it out?**  RPL will consist of four stages   1. Counselling- To inform, advise and guide the candidates regarding RPL 2. Pre-Assessment- To assess the current competencies of the candidates and identifying the gap between the full qualification and current competencies. 3. Orientation &Bridge Training- To train the candidates for bridging the gap. 4. Final assessment & Certification- To assess the candidate for full qualification and certify.   RPL assessment will be managed by PBSSD (Paschim Banga Society for Skill Development) under Department of Technical Education, Training & Skill Development, Govt. of West Bengal.  **Describe the overall assessment strategy and specific arrangements which have been put in place to ensure that assessment is always valid, reliable and fair and show that these are in line with the requirements of the NSQF.**  Assessment will be carried out by Board of Examination under West Bengal State Council of Technical & Vocational Education & Skill Development, under Department of Technical Education, Training & Skill Development, Govt. of West Bengal.  The Council has all necessary infrastructure and pool of qualified Assessors/ Examiners to carry out such assessments. Presently the Council is conducting all examinations for all courses which includeDiploma Courses, Vocational Courses in VIII+ level and X+2 level &other Short term Courses. Council also conducts all State Level Entrance tests like JEXPO for admission to Diploma Courses in Polytechnics, VOCLET for lateral entry to Diploma Courses in Polytechnics and CET (Common Entrance Test ) for admission to NCVT courses in ITIs. |

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**ASSESSMENT EVIDENCE**

**Complete a grid for each component as listed in “Formal structure of the qualification” in the Summary.**

*NOTE: this grid can be replaced by any part of the qualification documentation which shows the same information – ie Learning Outcomes to be assessed, assessment criteria and the means of assessment.*

**Title of Component:**

|  |  |
| --- | --- |
| **Outcomes to be assessed** | **Assessment criteria for the outcome** |
| 1. Apply safe working Practices | (1.1) Assessor will note whether the trainee is maintaining procedures to achieve a safe working environment in line with occupational health and safety regulations and requirements according to site policy.  (1.2) Assessor will note whether the trainee can identify and demonstrate the application of safety devices used by a welder during welding.  (1.3) Assessor will assess the report/recordsubmitted by trainee to supervisor/ Competent of authority in the event of accident or sickness of any staff, including accident details according to site accident/injuryprocedures  (1.4) Trainee will be asked to demonstrate Personal Productive Equipment (PPE) and use the same as per related working environment.  (1.5) Trainee will be asked to demonstrate basic first aid and use them under different circumstances.  (1.6) Trainee will be asked to identify different fire extinguishers and to use the same as per requirement in a mock drill |
| 1. Understand electricity and its use in welding | (2.1) Trainee will be asked to define different basic terms used in electricity.  (2.2) Assessor will note whether Trainee be able to identify and demonstrate the use of ammeter and voltmeter.  (2.3) Trainee will be asked to demonstrate Ohm’s law.  (2.4) Assessor will note whether the trainee can demonstrate heating effect of current  (2.5) Trainee will be asked to demonstrate the use of electricity as applied to both AC and DC welding machine  (2.6) Trainee will be asked to demonstrate the application of AC and DC welding machine |
| 1. Understand arc formation and its characteristics and also principles of arc welding | (3.1) Trainee will be asked to demonstrate the principles of arc, characteristic of arc, effect of arc length.  (3.2) Trainee will be asked to demonstrate the effect of polarity on arc and their use.  (3.3) Assessor will note whether the trainee can demonstrate the defects such as arc blow, distortion in welding caused by arc along with the method of minimizing its effect.  (3.4) Trainee will be asked to demonstrate the principles of arc welding.  (3.5) Assessor will observe whether the trainee is able to describe the use of welding fixture.  (3.6) Trainee will be asked to demonstrate advantages and disadvantages of arc welding. |
| 1. Demonstrate different types of electrodes, their symbols, welding symbols, edge preparation | (4.1) Assessor will observe whether the trainee is able to identify different electrodes alongwith their symbols  (4.2) Assessor will observe whether the trainee will be able to recognisewelding symbols  (4.3) Trainee will be asked to demonstrate the reason of edge preparation required in different welding joint  (4.5) Assessor will observe whether the trainee is able to select amount of edge preparation in accordance with plate thickness with the help of Table.  (4.4) Assessor will observe whether the trainee is able to selectsize of electrodesin accordance with plate thickness with the help of Table.  (4.5) Trainee will be asked to select rated current against different plate thickness with the help of Table.  (4.6) Assessor will observe whether the trainee is able to select electrode holder according to LS-815-1974. |
| 1. Demonstrate different types of weld joins with neat and appropriate sketch. | (5.1) Assessor will observe whether the trainee is able to demonstrate different types of weld joint such as lap, flange, butt, corner, Tee, plug lap, strappedjoints with neat and appropriate sketches..  (5.2) Trainee will be able to describe the use of different weld joint.  (5.3) Trainee will be able to describebutt joint for various thickness of joining plate.  (5.4) Assessor will rate the trainee on his ability to demonstrate the Spot welding process used for single spot on three work pieces with help of neat sketch.  (5.5) Trainee will be asked to describe fillet weld joint with neat sketch. |
| 1. Know different motions involving deposition and number of pass | (6.1) Assessor will rate the trainee on his ability to describe the technique for weaving motion of electrode.  (6.2) Assessor will ask the trainee to describe the necessity of single pass and multi pass deposition of electrode  (6.3) Assessor will ask the trainee to describe different type of motion like looped motion, zigzag motion with the help of neat sketches.  (6.4) Assessor will ask the trainee to describe the use of different types of electrode motion and the corresponding weld bead. |
| 1. Perform arc welding in different joint of two plates having different thicknesses | (7.1) Assessor will observe whether the trainee is able to demonstrate different types of equipment used for arc welding process with neat sketches.  (7.2) Assessor will ask the trainee to describe different welding position such as horizontal(H) , flat(F) and overhead (OD).  (7.2) Assessor will rate the trainee on his ability to set up of ac apparatus.  (7.3) Trainee will be asked to perform arc welding to prepare F position bead on 8/6 mm MS plate  (7.4) Trainee will be asked to striking on arc.  (7.5) Assessor will rate the trainee on his ability to set up of ac apparatus.  (7.6) Trainee will be asked to perform arc welding to prepare different joint in the plates by preparing normal bead  (7.7) Assessor will rate the trainee on his ability to perform weaved bead on MS plate by arc welding  (7.8) Trainee will be asked to perform Fillet joint by arc welding |
| 1. Apply different passes according to requirement and perform weaving | (8.1) Assessor will rate the trainee on his ability to perform weaved bead on MS plate by arc welding  (8.2) Trainee will be asked to perform weaved bead on plates having different thicknesses. |
| 1. Understand principles of gas welding and distinguish different types of flame. | ( 9.1) Assessor will rate the trainee on his ability to demonstrate principles of gas welding with the help of neat sketch  (9.2) Trainee will be asked to describe different components needed in gas welding along with their uses.  (9.3) Assessor will rate the trainee on his ability to demonstrate different types of flames used in gas welding, their characteristics and their use with the help of neat sketch. |
| 1. Perform gas welding. | (10.1) Assessor will rate the trainee on his ability to perform normal bead on MS plate by gas welding  (10.2) Trainee will be asked to perform different joint with/without use of filler material by gas welding |
| 1. Test and recognise various defect of welding for plates and pipes. Test and recognise various defect of welding for plates and pipes. | (11.1) Trainee will be asked to demonstrate common defects occur during welding with help of neat sketches.  (11.2) Trainee will be asked to demonstrate some methods to minimize the defects caused during welding. |
| 1. Understand and practice soft skills | (12.1) Assessor will rate the trainee on his ability to practice soft skills, including clear and concise communication, in day to day work with team and with higher authority |
| 1. Perform winding for armature and single phase AC motors along concepts for three phase motors | (13.1)Trainee will be asked to measure Current, Voltage and Resistance of Single Phase and Three phase load.  (13.2) Trainee will be able to verify the characteristics of series, parallel and its combination circuits.  (13.3) Trainee will be able to identify the phase, neutral and earth in single and three phase supply.  (13.4) Assessor will rate the trainee on his ability to strip old winding by using appropriate methods  (13.5) Trainee will be able to insert coil in the armature and complete winding of armature  (13.6) Trainee will be able to test armature winding by growler and use insulating paper and wooden/insulating stick as per slot of the core  (13.7) Trainee will be able to prepare the winding coil as per size, no. of turns and coil pitch.  (13.8) Trainee will be able to insert the coil and mark start/end point, including connection of the coil  (13.9) Assessor will rate the trainee on his ability to test the continuity and winding insulation  (13.10) Assessor will rate the trainee on his ability to assemble a motor and run the same |
| 1. Demonstrate knowledge of concept and principles of basic arithmetic and financial calculation, and apply knowledge of specific area to perform practical operations. | (14.1) Apply basic arithmetic calculations for arriving dimensional parameters as per drawing.  (14.2) Apply basic financial calculation to understand cost of materials & labour and basic concepts of profit/loss,  (14.3) Engage in basic banking transactions as customer |
| 1. Explain time management, entrepreneurship and manage/organize related task in day to day work for personal & social growth. | (15.1) Ascertain appropriate time for the assigned task.  (15.2) Execute the assigned task within time frame.  (15.3) Manage own work within specified time.  (15.4) Explain importance & factors affect the development ofentrepreneurship.  (15.5) Identify service providers for developingentrepreneur/business establishment. |
| **Means of assessment 1**  There will be two types of Assessments viz. Formative and Summative. The Formative Assessment will be carried out continuously during the conduct of course and Summative Assessment will be carried out at the end of the course. Details are mentioned under means of Assessment-2. Written test, Practical examination/ Skill test & Viva voce | |
| **Means of assessment 2**   1. **Means of Formative Assessment (Total marks allotted- 350)** 2. Assignments for each module of Theory component 3. Assignments for each module of Employability Skills component 4. Continuous evaluation of each module of Practical 5. **Means of Summative Assessment(Total marks allotted- 650)** 6. Written test for Theory component 7. Written test for Employability Skills component 8. Practical Test & Viva voce forPractical Component.   Component wise distribution of marks is given in the Annexure 2 | |
| **Pass/Fail**   |  | | --- | | **Pass/Fail**  Passing criteria is based on marks obtained in Formative and Summative Assessment taken together as mentioned in Annexure No-1   1. Minimum Marks to pass Theory component– 60% 2. Minimum Marks to pass Employability Skills component– 60% 3. Minimum Marks to pass practical component– 70% 4. Minimum attendance required to appear in the final examination- 75% | | |

**SECTION 2**

**EVIDENCE OF LEVEL**

**OPTION A**

| **Title/Name of qualification/component: Asst. House Wireman and Motor Winder Level:** 3 | | | |
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| **NSQF Domain** | **Outcomes of the Qualification/Component** | **How the outcomes relates to the NSQF level descriptors** | **NSQF Level** |
| Process | Job holder will be able to joined or fabricate metallic plates of different thicknesses by means of arc welding and gas welding. They can also use | Job holder will understand and comply with safety practices while undertaking works in welding. The nature of work involved is repetitive and routine. | Level 3 |
| Professional knowledge | Job holder will be able to   * Understand fundamental electric and arc related theories, signs & symbols, select electrode, rated current, type of joint, no. of pass and no. of layer of deposition from chart and tables. * Use different tools &equipment * Understand basic principles for arc and gas welding * Understand defects and remedies of welding | Job holder will understand the basic concepts, facts, principles and processes in relation with arc and gas welding. It is also expected that the job holder will be able to comprehend welding practice. | Level 4 |
| Professional skill | The user/individual will know and understand how to:   * assess and decide whether the plates may be joined by arc/gas welding, and correspondingly the rated current, deposition rate, edge preparation * decide movement of electrode for proper deposition on basis of type of joint * decide whether workplace is safe for working and also relevant task isnot creating hazardous condition * engage electrode properly for different position welding (H,F, OH) | The job holder will demonstrate use of various tools and materials, different types of electric welding machine, type of gas flame, electrode, etc. and also ensure proper welding condition in safe mode. He/ she will be also able to demonstrate proper arc and gas welding principle. The range of application of practical skill is narrow and repetitive. | Level 3 |
| Core skill | The job holder will be able to   * read at least two languages, preferably in the local language of the siteand basic English * read and interpret safety sign boards, signage, tags etc. provided atworkplace * speak in at least one language, preferably in one of the local languages of thesite * listen and interpret instructions / communication by co-workers * listen and follow instructions given by supervisor * orally and effectively communicate with team members * engage in basic financial and banking transactions * Understand principles of time management and entrepreneurship | The job holder will be able to communicate clearly, both in writing and orally, with co-workers, supervisors and customers. He will be able to use basic arithmetic calculations for his work and use basic banking services both on professional and personal level. | Level 3 |
| Responsibility | The job holder will work under the close supervision of supervisor and he will be responsible for   * Understanding safety compliance while welding * Preventing fire hazards and loss of human life by use of appropriate tools and apparatus. * Distinguishing between different types of welding * Identifying different types defects in welding | Job holder is required to carry out welding. In these activities job holder is doing the tasks independently, with supervision in certain risky jobs. | Level 3 |

**SECTION 3**

**EVIDENCE OF NEED**

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| **What evidence is there that the qualification is needed?**  In modern industrial scenario, welding becomes an interdisciplinary field of application. An welder is specified now by amount of consumable (in kg) deposited by an operator per dayand the amount is fairly low relative to the world standard. Moreover there is a thumb rule about the amount of welding consumable required to construct per ton steel. Per capita comsumption of steel for an Indian is very low relative to world standard. So there will be immense scope of increasing steel consumption in India in near future and so also the scope for increase of consumable deposition that requires a huge amount of welder very soon. Every fabrication, heavy construction, even for electronic chip require skilled welder.  Thus there is scarcity of skilled welder in the country. Welding is a high skilled job which provide good salary and status. Several Industries/ Employers/ Associations both in Govt. and Private sectors (Indira Gandhi Nuclear Power Plant, (Kalapakkam), Bombay High, L&T, ABB, ESAB, Rilience, Large contractors firms, etc. ) have also indicated that there is a requirement for persons having basic skills in arc and gas welding.Further in the rural area and small urban town there is a huge opportunity for self-employment of the skilled persons in grill making, domestic furniture like almirah making. |
| **What is the estimated uptake of this qualification and what is the basis of this estimate?**  The estimated uptake of the qualification in the state of West Bengal as on date is 15000. This estimate is based on the data received from user industries viz. CESC, WBSEDCL, PWD (Electrical), Large contractors firms etc. |
| **What steps were taken to ensure that the qualification does not duplicate already existing or planned qualifications in the NSQF?**  This qualification is being conducted under the West Bengal State Council of Technical & Vocational Education & Skill Development under Department of Technical Education, Training and Skill Development since the academic year 2005 in Vocational Training Centres spread all over West Bengal for class- VIII+ pass dropout youths. In the state of West Bengal the Council is affiliating and awarding body for this qualification. Thus there is no other existing or planned qualification (Short term courses) in the state aligned with NSQF. |
| **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?**  The council has three well defined sub-committees namely Board of Studies and Skilling, Board of Examination and Recognition Committee. These committees monitor and review the progress of all qualifications under its purview on a regular basis.  This qualification will be reviewed and revised at an interval of three years on the basis of the outcome of the trainees, placement and self-employment data and feedback from concerned industries/employers. |

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

Give the titles and other relevant details of the document(s) here. Include page references showing where to find the relevant information.

**SECTION 4**

**EVIDENCE OF PROGRESSION**

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| **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?**  The trainee on completion of the course does not immediately qualify to work as an independent authority. The trainee has to gain at least 2 years of field experience, when he will become eligible to work as a welder under a Sr. Welder. From there, he can become either an employee of an organization or become self-employed. In case of employment under an employer, he can progress to various level-wise designations, based on either experience or on obtaining subsequent qualifications. This is as shown below.  Jr. Welder  Welder  Sr. Welder |