

**VQA**

**NATIONAL QUALIFICATION**

**11UY0014-3**

**ALUMINIUM WELDER**

**LEVEL 3**

**Revision Nr: 00**

**VOCATIONAL QUALIFICATIONS AUTHORITY**

**Ankara, 2011**

PREFACE

The National Qualification for **Aluminium Welder (Level 3)** was designed as per provisions of the “Vocational Qualification, Testing and Certification Regulation” introduced in accordance with the Vocational Qualification Authority Law No. 5544.

The qualification draft was prepared by the Vocational Qualification Authority (VQA). Opinions were received from the related institutions and organizations regarding the draft and the necessary arrangements were made after assessing these opinions. After the final draft was analysed and evaluated by the VQA Metal Sector Committee and their opinions were received by the Committee; the final draft was approved with the decision dated 12.07.2011 and numbered 2011-49 made by the VQA Board of Directors and was decided to be included in the National Qualification Framework (NQF).

We would like to thank every person, institution and organization that contributed to the preparation of the qualification and provided feedback and support to the analysis and verification phase. We are pleased to introduce this Qualification to the interested and relevant parties.

The Vocational Qualifications Authority

INTRODUCTION

The key criterions for preparing the national qualification, analysing it in sector committees and putting it into effect upon approval by the VQA Board of Directors are stipulated in the Regulation on Vocational Qualification, Testing and Certification.

The national qualification is defined under the following items;

a) Name and level of the qualification

b) Purpose and rationale of the qualification

c) Related sector of the qualification

d) Education and experience requirements for the qualification such as the method, content and duration

e) Occupational standard, occupational standard units/roles and/or qualification units that constitute the basis for the qualification

f) Learning outputs required for the attainment of the qualification,

g) Assessment procedures and principles to be applied for the attainment of the qualification, minimum examination material required for the assessment and the assessment criterions,

h) Conditions regarding the duration of validity and renewal requirements of the qualification certificate and, if deemed necessary, conditions regarding the monitoring of the certificate owner.

National qualifications are prepared, if available, based on the related national vocational standard; if not available, they are prepared on the basis of the international vocational standard.

National qualifications are prepared by one of the following or in cooperation of the following institutions/organizations:

* Formal and non-formal educational institutions
* Authorized certification bodies
* Institutions that have made a pre-application for authorization
* Organizations that prepared a national vocational standard
* Occupational organizations

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| **11UY0014-3 ALUMINIUM WELDER**  **NATIONAL QUALIFICATION** | | | |
| **1** | **QUALIFICATION TITLE** | | Aluminium welder |
| **2** | **REFERENCE CODE** | | 11UY0014-3 |
| **3** | **LEVEL** | | 3 |
| **4** | **INTERNATIONAL CLASSIFICATION** | | ISCO 08: 7212 |
| **5** | **TYPE** | | - |
| **6** | **CREDIT VALUE** | | - |
| **7** | **A) DATE OF PUBLICATION** | | 12.07.2011 |
| **B) REVISION NR** | | 00 |
| **C) REVISION DATE** | | - |
| **8** | **AIM** | | This qualification is prepared to establish, examine and certify the qualification of a welder who has the ability to implement fusion welding methods on aluminium and aluminium alloys either manually or by using semi-mechanized equipment. |
| **9** | **OCCUPATIONAL STANDARD(s) AS THE BASIS FOR THE QUALIFICATION** | | |
| TS EN ISO 9606-2 Welders’ Qualification Exam – Fusion Welding Part 2: Aluminium and Aluminium Alloys | | | |
| **10** | **ENTRY REQUIREMENTS FOR QUALIFICATION EXAM** | | |
| - | | | |
| **11** | **QUALIFICATION STRUCTURE** | | |
| **11-a) Compulsory Units** | | | |
| 11UY0014-3/A1 Occupation Health and Safety in Welding Work | | | |
| **11-b) Optional Units** | | | |
| 11UY0014-3/B1 Metal - Arc Inert Gas Welding (MIG Welding)-Aluminium (131)  11UY0014-3/B2 Tungsten Inert Gas Arc Welding (TIG Welding) -Aluminium(141)  11UY0014-3/B3 Plasma Arc Welding -Aluminium(15) | | | |
| **11-c) Grouping Alternatives of Units and Additional Learning Outcomes** | | | |
| For a qualification certificate, a welder should be successful in the Group A compulsory qualification unit and in at least one of Group B qualification units. | | | |
| **12** | **TESTING AND ASSESSMENT** | | |
| The qualification requires welders to be successful in Group A elective qualification unit/units’ exam in which the subject of A1 and welding method are included. | | | |
| **13** | **VALIDITY DURATION OF THE CERTIFICATE** | Issued qualification of welder shall be valid for a period of two years. Validity period of the certificate starts as of the date on which examination item is welded. Qualification of a welder shall be valid for a period of two years provided that the certificate concern is signed by employer/coordinator at intervals of 6 months and that the following conditions are duly fulfilled.  a) A welder should prove that he performs welding works in which he is proved to be adequate. A period of suspension less than 6 months is permitted.  b) Working of the welder should correspond to the technical conditions of the qualification examination.  c) No special reason regarding the investigation of the knowledge and skill of the welder should be present.  If a welder fails to comply one of these conditions, the qualification shall be rendered invalid. | |
| **14** | **MONITORING FREQUENCY** | Semi-annually submitting a document proving that he is still working in the company concerned | |
| **15** | **TESTING-ASSESSMENT METHOD TO BE USED DURING CERTIFICATE RENEWAL** | Qualification certificate can be renewed for 2-year periods by the person or organization that performed the examination. The validity period stated in the certificate can be renewed for a period of two years, on condition that provisions regarding Article 5.3 of TS EN ISO 9606-2 and the following conditions with regard to this, within the scope of the qualification field. Manufacture welding should meet the necessary quality. Test records such as SHATTERING inspection or x-ray or ultrasonic inspection documents, or comments of coordinator in charge should be included in the file on welder qualification certification. Examiner authority or organization should approve that the above mentioned conditions are met and sign the qualification certificate of the welder. | |
| **16** | **INSTITUTION(S) THAT DEVELOPED THE QUALIFICATION** | VQA | |
| **17** | **SECTOR COMMITTEE THAT VALIDATED THE QUALIFICATION** | Metal Sector Committee | |
| **18** | **DATE AND NR. OF APPROVAL BY VQA EXECUTIVE BOARD** | 12.07.2011/2011-49 | |

**ANNEXES**

**ANNEX 1:** Qualification Units

11UY0014-3/A1 Occupation Health and Safety in Welding Work

11UY0014-3/B1 Metal - Arc Inert Gas Welding (MIG Welding)-Aluminium (131)

11UY0014-3/B2 Tungsten Inert Gas Arc Welding (TIG Welding) -Aluminium (141)

11UY0014-3/B3 Plasma Arc Welding -Aluminium (15)

**ANNEX 2:** Terms, Symbols and Abbreviations

**MAIN MATERIAL:** Main material to be bonded with weld.

**FILLING MATERIAL:** Consumables used in welding of the main material.

**WELDING SEAM GAP:** To prepare the parts in accordance with the shapes stated in WPS to enhance dilution.

**WELDER:** Person who holds the welding torch and who handle it.

**WELDING PROCEDURE SPECIFICATION (WPS):** Document that includes detail of the necessary variables to enable the repeatability of the quality of the welded connection.

**PASS:** Each line of the welding seam implemented during the welding procedure.

**TS:** Turkish Standards

**WELDING TORCH:** The apparatus that is held and handled by the welder in MIG, TIG and Plasma Welding methods.

**11UY0014-3/A1 QUALIFICATION UNIT FOR OCCUPATION HEALTH AND SAFETY IN WELDING WORK**

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| **1** | **QUALIFICATION UNIT TITLE** | A1 OCCUPATION HEALTH AND SAFETY IN WELDING WORK | |
| **2** | **REFERENCE CODE** | 11UY0014-3/A1 | |
| **3** | **LEVEL** | 3 | |
| **4** | **CREDIT VALUE** | - | |
| **5** | **A) DATE OF PUBLICATION** | 12.07.2011 | |
| **B) REVISION NR** | 00 | |
| **C) REVISION DATE** | - | |
| **6** | **OCCUPATIONAL STANDARD AS THE BASIS OF THE QUALIFICATION UNIT** | | |
| EN ISO 9606-2 Welders’ Qualification Exam – Fusion Welding Part 2: Aluminium and Aluminium Alloys | | | |
| **7** | **LEARNING OUTCOMES** | | |
| **Learning Outcome 1: To have the knowledge and ability regarding occupational health and safety in welding works**  **Performance Criteria**  1.1: Has the basic knowledge on first aid.  1.2: Identifies legal necessities on occupational health and safety and also the rules of workplace.  1.3: Observes the emergency procedure.  1.4: Knows the fire hazard and necessary measurements.  1.5: Knows personal protection methods and knows how to use protective equipment securely.  1.6: Knows the assembly, adjustment, shutting down and maintenance procedures of the equipment that he uses.  1.7: Identifies the results that would emerge in case of a malpractice of the welding procedure and instructions.  1.8: Identifies safety measures to be taken in the working areas with high danger of gas leakage, electric leakage and electrical hazard.  1.9: Knows the damages of welting gas smoke and radiation; also knows protection methods.  1.10: Knows the importance of ventilation of the working place; also knows how to ventilate it.  1.11: Knows the safety of gas storage, transportation of gas and use it with pressure.  1.12: Determines leaking in gas hose and connectors; also knows safe usage.  **Learning Outcome 2: Identification of hazards and risks regarding the occupational safety**  **Performance Criteria**  2.1: Identifies electrical and mechanical hazards likely to occur during the welding operation.  2.2: Identifies the hazards to be entailed by welding smoke and gas that rise during the welding operation.  2.3: Identifies noise and radiation hazards that he is likely to be exposed to in the working area.  2.4: Identifies flammable, combustible and explosive materials, and takes necessary precautions.  **Learning Outcome 3: Identification of the effects of the elements that threaten occupational health and safety.**  **Performance Criteria**  3.1: Identifies the environments on which the electrical hazard is high.  3.2: Identifies the effects of the radiation, heat and splashing that rises from the arc.  3.3: Identifies negative effects that are likely to occur as a result of the insufficient grounding and insufficient contact. | | | |
| **8** | **TESTING AND ASSESSMENT** | | |
| **8 a) Theoretical Exam** | | | |
| Theoretical exam may be carried out in either of the following methods:  (T1) Multiple choice written exam (4 choices),  (T2) Oral exam with open-ended questions.  Vocational knowledge examination includes learning outputs in the qualification unit regarding the welding operation used in the qualification examination. Certification bodies shall determine which examination type (T1 or T2) will be applied. In the qualification certificates of the welders who took theoretical exam, this condition shall be stated. T1 examination includes 10 questions and approximately 2 – 2.5 minutes per question shall be granted. T2 examination consists of 3 questions.  **Success Criteria:** To succeed in T1 or T2 exams, a welder has to receive minimum 50 points over 100 points. | | | |
| **8 b) Performance Exam** | | | |
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| **8 c) Other requirements regarding testing and assessment** | | | |
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| **9** | **INSTITUTION(S) THAT DEVELOPED THE QUALIFICATION** | | VQA |
| **10** | **SECTOR COMMITTEE THAT VALIDATED THE QUALIFICATIONS** | | METAL SECTOR COMMITTEE |
| **11** | **DATE AND NR. OF APPROVAL BY VQA EXECUTIVE BOARD** | | 12.07.2011/2011-49 |

**11UY0014-3/B1 METAL - ARC INERT GAS WELDING (MIG WELDING)-ALUMINIUM (131) QUALIFICATION UNIT**

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| **1** | **QUALIFICATION UNIT TITLE** | 11UY0014-3/B1 Metal - Arc Inert Gas Welding (MIG Welding)-Aluminium (131) | |
| **2** | **REFERENCE CODE** | 11UY0014-3/B1 | |
| **3** | **LEVEL** | 3 | |
| **4** | **CREDIT VALUE** | - | |
| **5** | **A) DATE OF PUBLICATION** | 12.07.2011 | |
| **B) REVISION NR** | 00 | |
| **C) REVISION DATE** | - | |
| **6** | **OCCUPATIONAL STANDARD AS THE BASIS OF THE QUALIFICATION UNIT** | | |
| EN ISO 9606-2 Welders’ Qualification Exam – Fusion Welding Part 2: Aluminium and Aluminium Alloys | | | |
| **7** | **LEARNING OUTCOMES** | | |
| **Learning Outcome 1:**  **Identification of Metal Arc Inert Gas Welding Equipment**  **Performance Criteria**  1.1: Identifies basic elements and the equipment of the welding machine.  1.2: Identifies types and sizes of the welding wire.  1.3: Identifies the type and size of the nozzle and contact tip (contact nozzle).  1.4: Identifies storage, transportation and usage conditions of the main material and welding wire.    **Learning Outcome 2: Performing aluminium welding operation with Metal Arc Inert Gas (MIG) Method**  **Performance Criteria**  2.1: Welds in accordance with the draft or approved Welding Procedure Specification (WPS).  2.2: Reports any malfunction of the welding apparatus.  2.3: Knows the relationship between parameter variations and the results of the welding operation.  2.4: Has the basic electrical knowledge on arc welding.  2.5: Identifies the welding seam measuring devices.  2.6: Has information on the choosing the type and flow-rate of the shielding gas.  2.7: Identifies types of currents used in welding.  2.8: Knows the importance of preserving welding arc and bath from air stream.  2.9: Recognizes main material in terms of weldibility.  2.10: Identifies defects in weld and reasons of them.  2.11: Knows ways to prevent from and removal of the defects in weld.  2.12: Performs the maintenance of nozzle and contact tip (contact nozzle).  2.13: Makes the right connection of arc welding torch and ground cable.  2.14: Makes the right selection of the types and sizes of the welding wire.  2.15: Choses the proper wire feed pulley.  2.16: Cleans the surfaces to be fusioned and passes’ gap properly.  2.17: Performs arrangements in welding bend of the items to be welded.  2.18: Uses welding seam measuring devices.  2.19: Performs necessary cleaning on torch, wire pulley, gas nozzle, wire feed mechanism and gas hoses and assemble them.  2.20: Performs preheating required by the main material.  2.21: Welds with the speed required by the welding process and in an appropriate position.  2.23: Keeps the main material and the welding wire under suitable conditions. | | | |
| **8** | **TESTING AND ASSESSMENT** | | |
| **8 a) Theoretical Exam** | | | |
| Theoretical exam may be carried out in either of the following methods:  (T1) Multiple choice written exam (4 choices),  (T2) Oral exam with open-ended questions.  Vocational knowledge examination includes learning outputs in the qualification unit regarding the welding operation used in the qualification examination. Certification bodies shall determine which examination type (T1 or T2) will be applied. In the qualification certificates of the welders who took theoretical exam, this condition shall be stated. T1 examination includes 10 questions and approximately 2 – 2.5 minutes per question shall be granted. T2 examination consists of 3 questions.  **Success Criteria:** To succeed in T1 or T2 exams, a welder has to receive minimum 50 points over 100 points. | | | |
| **8 b) Performance Exam** | | | |
| **(P1) Practical Examination:** A welder is sit for an examination that includes each of the learning outcomes in accordance with the pWPS (draft welding procedure specification) or WPS (welding specification procedure) prepared as per EN-ISO-15609-1. Welding period should be in accordance with the working period in the manufacture conditions.  **Success Criteria:** According to TS EN ISO 10042+AC, welding edge defects such as over-welding metal, over convexity, over density, over penetration, and combustion ducting in the examination item within the limit of C level; other defects in the examination item within the limit of B level it is considered sufficient. At the end of the bending test no crack bigger than 3 mm, in any direction should be present. Unless there is evidence that the crack observed at the edge of the test sample has its source in insufficient penetration, slag or other cracks, it should not be taken into consideration during the assessment of the examination. If it is determined that the defects in the examination item of the welder exceed the maximum values, qualification of the welder shall not be approved. For non-destructive testing, relevant acceptance criteria should be referred. Indicated procedures should be used for all the destructive tests and non-destructive testing.  **Repetition of the examination:** A welder should be given a chance to re-take the qualification exam if he is found unsuccessful in meeting the conditions regarding the examination item’s standards.  If the failure is confirmed to be raised as a result of the metallurgical or other external factors, not as a result of the insufficient skill of the welder, additional examination should take place to assess the quality and integrity of the new examination material and/or new examination conditions. | | | |
| **8 c) Other requirements regarding testing and assessment** | | | |
| To receive vocational certificate, an applier has to succeed in Theoretical (T1 or T2) exams and exams based on performance. | | | |
| **9** | **INSTITUTION(S) THAT DEVELOPED THE QUALIFICATION** | | VQA |
| **10** | **SECTOR COMMITTEE THAT VALIDATED THE QUALIFICATIONS** | | METAL SECTOR COMMITTEE |
| **11** | **DATE AND NR. OF APPROVAL BY VQA ADMINISTRATIVE BOARD** | | 12.07.2011/2011-49 |

**11UY0014-3/B2 TUNGSTEN INERT GAS ARC WELDING (TIG WELDING) -ALUMINIUM (141) QUALIFICATION UNIT**

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| **1** | **QUALIFICATION UNIT TITLE** | 11UY0014-3/B2 Tungsten Inert Gas Arc Welding (TIG Welding) -Aluminium (141) | |
| **2** | **REFERENCE CODE** | 11UY0014-3/B2 | |
| **3** | **LEVEL** | 3 | |
| **4** | **CREDIT VALUE** | - | |
| **5** | **A) DATE OF PUBLICATION** | 12.07.2011 | |
| **B) REVISION NR** | 00 | |
| **C) REVISION DATE** | - | |
| **6** | **OCCUPATIONAL STANDARD AS THE BASIS OF THE QUALIFICATION UNIT** | | |
| EN ISO 9606-2 Welders’ Qualification Exam – Fusion Welding Part 2: Aluminium and Aluminium Alloys | | | |
| **7** | **LEARNING OUTCOMES** | | |
| **Learning Outcome 1:**  **Identification of Tungsten Inert Gas Arc Welding Equipment**  **Performance Criteria**  1.1: Identifies basic elements and the equipment of the welding machine.  1.2: Identifies types and sizes of the welding wire and the electrodes.  1.3: Identifies the type and size of the nozzle and contact tip (contact nozzle).  1.4: Identifies storage, transportation and usage conditions of the main material and welding wire.    **Learning Outcome 2: Performing Tungsten Inert Gas Arc Welding Operations**  **Performance Criteria**  2.1: Welds in accordance with the draft or approved Welding Procedure Specification (WPS).  2.2: Performs pre-heating methods.  2.3: Reports any malfunction of the welding apparatus.  2.4: Knows the relationship between parameter variations and the results of the welding operation.  2.5: Has the basic electrical knowledge on arc welding.  2.6: Has knowledge on the welding seam measuring devices.  2.7: Has information on the choosing the type and flow-rate of the shielding gas.  2.8: Has information on types of welding current.  2.9: Knows the importance of preserving welding arc and bath from air stream.  2.10: Recognizes main material in terms of weldibility.  2.11: Identifies defects in weld and reasons of them.  2.12: Knows ways to prevent from and removal of the defects in weld.  2.13: Performs the assembly operation of the main elements connected to welding machine and equipment.  2.14: Performs the maintenance of nozzle and contact tip (contact nozzle).  2.15: Makes the right connection of arc welding torch and ground cable.  2.16: Makes the right selection of the types and sizes of the welding wire electrodes.  2.17: Performs preparation process on welding bends of the materials to be welded.  2.18: Uses welding seam measuring devices.  2.19: Performs necessary cleaning on torch, cooling system, gas nozzle, wire feed mechanism and gas hoses and assemble them.  2.20: Has the handcraft to perform weld in the speed, required by the welding process, and in appropriate position.  2.21: Keeps the main material and the welding wire under suitable conditions.  2.22: Has knowledge on preparing and positioning of the welding electrode tip.  2.23: Feeds the molten tip of the welding wire, without taking it out from the shielding gas zone, at an appropriate speed. | | | |
| **8** | **TESTING AND ASSESSMENT** | | |
| **8 a) Theoretical Exam** | | | |
| Theoretical exam may be carried out in either of the following methods:  (T1) Multiple choice written exam (4 choices),  (T2) Oral exam with open-ended questions.  Vocational knowledge examination includes learning outputs in the qualification unit regarding the welding operation used in the qualification examination. Certification bodies shall determine which examination type (T1 or T2) will be applied. In the qualification certificates of the welders who took theoretical exam, this condition shall be stated. T1 examination includes 10 questions and approximately 2 – 2.5 minutes per question shall be granted. T2 examination consists of 3 questions.  **Success Criteria:** To succeed in T1 or T2 exams, a welder has to receive minimum 50 points over 100 points. | | | |
| **8 b) Performance Exam** | | | |
| **(P1) Practical Examination:** A welder is sit for an examination that includes each of the learning outcomes in accordance with the pWPS (draft welding procedure specification) or WPS (welding specification procedure) prepared as per EN-ISO-15609-1. Welding period should be in accordance with the working period in the manufacture conditions.  **Success Criteria:** According to TS EN ISO 10042+AC, welding edge defects such as over-welding metal, over convexity, over density, over penetration, and combustion ducting in the examination item within the limit of C level; other defects in the examination item within the limit of B level it is considered sufficient. At the end of the bending test no crack bigger than 3 mm, in any direction should be present. Unless there is evidence that the crack observed at the edge of the test sample has its source in insufficient penetration, slag or other cracks, it should not be taken into consideration during the assessment of the examination. If it is determined that the defects in the examination item of the welder exceed the maximum values, qualification of the welder shall not be approved. For non-destructive testing, relevant acceptance criteria should be referred. Indicated procedures should be used for all the destructive tests and non-destructive testing.  **Repetition of the examination:** A welder should be given a chance to re-take the qualification exam if he is found unsuccessful in meeting the conditions regarding the examination item’s standards. If the failure is confirmed to be raised as a result of the metallurgical or other external factors, not as a result of the insufficient skill of the welder, additional examination should take place to assess the quality and integrity of the new examination material and/or new examination conditions. | | | |
| **8 c) Other requirements regarding testing and assessment** | | | |
| To receive vocational certificate, an applier has to succeed in Theoretical (T1 or T2) exams and exams based on performance. | | | |
| **9** | **INSTITUTION(S) THAT DEVELOPED THE QUALIFICATION** | | VQA |
| **10** | **SECTOR COMMITTEE THAT VALIDATED THE QUALIFICATIONS** | | METAL SECTOR COMMITTEE |
| **11** | **DATE AND NR. OF APPROVAL BY VQA EXECUTIVE BOARD** | | 12.07.2011/2011-49 |

**11UY0014-3/B3 PLASMA ARC WELDING -ALUMINIUM (15)** **QUALIFICATION UNIT**

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| **1** | **QUALIFICATION UNIT TITLE** | 11UY0014-3/B3 Plasma Arc Welding -Aluminium (15) | |
| **2** | **REFERENCE CODE** | 11UY0014-3/B3 | |
| **3** | **LEVEL** | 3 | |
| **4** | **CREDIT VALUE** | - | |
| **5** | **A) DATE OF PUBLICATION** | 12.07.2011 | |
| **B) REVISION NR** | 00 | |
| **C) REVISION DATE** | - | |
| **6** | **OCCUPATIONAL STANDARD RELATED TO THE QUALIFICATION UNIT** | | |
| EN ISO 9606-2 Welders’ Qualification Exam – Fusion Welding Part 2: Aluminium and Aluminium Alloys | | | |
| **7** | **LEARNING OUTCOMES** | | |
| **Learning Outcome 1:**  **Identification of Plasma Arc Welding** **Equipment**  **Performance Criteria**  1.1: Identifies basic elements and the equipment of the welding machine.  1.2: Identifies types and sizes of the welding wire and the electrodes.  1.3: Identifies the type and size of the nozzle and contact tip (contact nozzle).  1.4: Identifies the main material and welding wire.    **Learning Outcome 2: Performing Plasma Arc Welding Processes**  **Performance Criteria**  2.1: Determines the shielding gas convenient to the process.  2.2: Regulates the flow rate of the shielding gas.  2.3: Knows the ways of prevention from welding arc blow.  2.4: Welds in accordance with the draft or approved Welding Procedure Specification (WPS).  2.5: Knows the relationship between parameter variations and the results of the welding operation.  2.6: Reports any malfunction of the welding apparatus.  2.7: Checks the convenience of the pre-heating and heat between the passes.  2.8: Applies pre-heating methods.  2.9: Uses welding seam measuring devices.  2.10: Performs the assembly process of the main elements.  2.11: Identifies types of the plasma gas and shielding gas.  **Learning Outcome 3: Identification of main materials and consumables**  **Performance Criteria**  3.1: Identifies main material and consumables relevant to welding.  3.2: Knows appropriate storage conditions of the consumables.  3.3: Chooses the right types of the consumables to be used.  3.4: Checks the cleanliness, convenience and usage conditions of the wires and electrodes. | | | |
| **8** | **TESTING AND ASSESSMENT** | | |
| **8 a) Theoretical Exam** | | | |
| Theoretical exam may be carried out in either of the following methods:  (T1) Multiple choice written exam (4 choices),  (T2) Oral exam with open-ended questions.  Vocational knowledge examination includes learning outputs in the qualification unit regarding the welding operation used in the qualification examination. Certification bodies shall determine which examination type (T1 or T2) will be applied. In the qualification certificates of the welders who took theoretical exam, this condition shall be stated. T1 examination includes 10 questions and approximately 2 – 2.5 minutes per question shall be granted. T2 examination consists of 3 questions.  **Success Criteria:** To succeed in T1 or T2 exams, a welder has to receive minimum 50 points over 100 points. | | | |
| **8 b) Performance Exam** | | | |
| **(P1) Practical Examination:** A welder is sit for an examination that includes each of the learning outcomes in accordance with the pWPS (draft welding procedure specification) or WPS (welding specification procedure) prepared as per EN-ISO-15609-1. Welding period should be in accordance with the working period in the manufacture conditions.  **Success Criteria:** According to TS EN ISO 10042+AC, welding edge defects such as over-welding metal, over convexity, over density, over penetration, and combustion ducting in the examination item within the limit of C level; other defects in the examination item within the limit of B level it is considered sufficient. At the end of the bending test no crack bigger than 3 mm, in any direction, should be present. Unless there is evidence that the crack observed at the edge of the test sample has its source in insufficient penetration, slag or other cracks, it should not be taken into consideration during the assessment of the examination. If it is determined that the defects in the examination item of the welder exceed the maximum values, qualification of the welder shall not be approved. For non-destructive testing, relevant acceptance criteria should be referred. Indicated procedures should be used for all the destructive tests and non-destructive testing.  **Repetition of the examination:** A welder should be given a chance to re-take the qualification exam if he is found unsuccessful in meeting the conditions regarding the examination item’s standards.  If the failure is confirmed to be raised as a result of the metallurgical or other external factors, not as a result of the insufficient skill of the welder, additional examination should take place to assess the quality and integrity of the new examination material and/or new examination conditions. | | | |
| **8 c) Other requirements regarding testing and assessment** | | | |
| To receive vocational certificate, an applier has to succeed in Theoretical (T1 or T2) exams and exams based on performance. | | | |
| **9** | **INSTITUTION(S) THAT DEVELOPED THE QUALIFICATION** | | VQA |
| **10** | **SECTOR COMMITTEE THAT VALIDATED THE QUALIFICATIONS** | | METAL SECTOR COMMITTEE |
| **11** | **DATE AND NR. OF APPROVAL BY VQA EXECUTIVE BOARD** | | 12.07.2011/2011-49 |