**VQA**

**NATIONAL QUALIFICATION**

**11UY0015-4**

**RESISTANCE WELD SETTERS**

**LEVEL 4**

REVISION NO: 00

VOCATIONAL QUALIFICATION AUTHORITY

Ankara, 2011

**PREFACE**

This reference guide, namely **“Resistance Weld Setter – 4th Level** National Qualification”**,** has beenprepared in accordance withthe provisions of the “Regulation on Vocational Qualifications, Testing and Certification” issued pursuant to the Vocational Qualifications Authority (VQA) Law no 5544.

The qualification draft has been drawn up by the VQA. After assessing opinions of the relevant organizations and institutions, the draft has been amended accordingly. The final draft has been evaluated by the VQA’s Metal Sector Committee which has deemed it suitable. It has been approved by the Board of Directors of the VQA through its decision no 2011/49 of July 12th 2011 and decided to be placed within the National Qualification Framework (NQF).

We would like to extend our gratitude to all people, organizations and institutions that have expressed their opinions and contributed to the preparation, examination and verification processes of the qualification. We would like to offer it to the service of all likely beneficiaries.

Vocational Qualifications Authority

**INTRODUCTION**

The key criteria referred to in the national qualification preparation process, the relevant sector committees’ review and the VQA’s Board of Directors’ approval processes are set in the Regulation on Vocational Qualification, Testing and Certification.

National qualification is defined by,

a) Name and level of the qualification

b) Aim and rationale of the qualification

c) Qualification related sector

ç) Training and experience criteria (form, content, duration etc) necessary for the qualification

d) Occupational standard, occupational standard units or qualification units which for the basis for the qualification

e) Learning outcomes necessary to acquire the qualification

f) Assessment procedures and principles to be applicable to in the acquisition of the qualification, minimum testing materials and assessor criteria necessary for assessment

g) Validity of the qualification certificate, renewal conditions, supervision of the certificate holder if deemed necessary

National qualifications are built according to the relevant national occupational standard if there is one or to the relevant international occupational standard if there is none at the national level. National qualifications are set in cooperation with the below bodies:

* Formal and non-formal education and training institutions,
* Authorized Certification Bodies
* Institutions having preapplied for certification to the authority
* Institutions having drawn up national occupational standard
* Professional organizations

**11UY0015-4 NATIONAL QUALIFICATION FOR RESISTANCE WELD SETTERS**

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| **1** | NAME OF THE QUALIFICATION | Resistance Weld Setter |
| **2** | REFERENCE CODE | 11UY0015-4 |
| **3** | LEVEL | 4 |
| **4** | INTERNATIONAL CLASSIFICATION CODE | ISCO 08: 7212 |
| **5** | TYPE | - |
| **6** | CREDIT VALUE | - |
| 7 | A)DATE OF PUBLICATION | 12.07.2011 |
| B)REVISION NO | 00 |
| C)REVISION DATE | - |
| **8** | AIM | This qualification has been prepared to define, test and certify qualifications of welding operators who carry out one of fusion welding methods of metallic materials by means of fully mechanized or automatic welding equipment. This qualification does not apply to welding operators who work at resistance welding and under high pressure.  |
| **9** | OCCUPATIONAL STANDARD(S) TO FORM THE BASIS FOR THE QUALIFICATION  |
| TS EN 1418 Welding Personnel- Qualification testing for welding operators and resistance weld setters for fully mechanized and automatic fusion welding of metallic materials  |
| **10** | Criteria to take a qualification test |
| - |
| **11** | STRUCTURE OF QUALIFICATION  |
| **11-a) Compulsory Units** |
| 11UY0014-3/A1 Occupational Health and Safety in welding operations  |
| **11-b) Optional Units**  |
| 11UY0015-4/B1 Resistance Spot Welding (21) 11UY0015-4/B2 Resistance Seam Welding (22) 11UY0015-4/B3 Resistance Projection Welding (23) 11UY0015-4/B4 Flash Butt Welding (24) 11UY0015-4/B5 Upset Welding (25) 11UY0015-4/B6 High Frequency Resistance Welding (291) |

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| 11-c)**Alternatives for Grouping Units and Additional Learning Outcomes**  |
| In order to be entitled to receive a qualification certificate, a candidate shall succeed in either group A qualification unit or group B qualification unit. |
| 12 | **ASSESSMENT and EVALUATION** |
| In order to be entitled to get qualification, a candidate shall succeed in A1 and elective qualification unit/units including welding methods.  |
| 13 | **VALIDITY OF QUALIFICATION CERTIFICATE** | A qualification testing certificate for a resistance weld setter is valid for two years. It becomes valid when the examination piece is considered as satisfactory in all relevant inspections. A resistance weld setter’s qualification is valid for a period of two years as long as the employer or coordinator signs his certificate every six months and all the below requirements are satisfied. a) A resistance weld setter shall prove that he continuously carries out welding operations for which he is qualified. He will be allowed to take a break of not more than 6 months. b) A resistance weld setter’s work in overall shall be in line with the technical conditions of the qualification examination. c) There should not be any specific reason to inquire into a resistance weld setter’s knowledge and skill. If any of the mentioned criteria is not met, a welder’s qualification certificate shall be cancelled. |
| 14 | **FREQUENCY OF SUPERVISION** | Shall present a document to prove that he continues to work at a given company or that he works as a freelancer every six months  |
| 15 | **ASSESSMENT METHODS TO BE FOLLOWED IN RENEWAL OF CERTIFICATES** | A qualification certificate can be extended in two year periods by the assessing person or authority. The validity of a qualification on a certificate can be extended for an additional two year period when all conditions defined in the article 5 of the TS EN 1418 are met. |
| 16 | **QUALIFICATION DEVELOPMENT INSTITUTION(S)** | VQA |
| 17 | **SECTOR COMMITTEE TO VERIFY QUALIFICATION** | Metal Sector Committee |
| 18 | **DATE AND NUMBER OF APPROVAL BY VQA EXECUTIVE BOARD** | 12.07.2011/2011-49 |

**ANNEXES:**

**ANNEX 1:** Qualification Units

11UY0014-3/A1 Occupational Health and Safety in welding operations

11UY0015-4/B1 Resistance Spot Welding (21)

11UY0015-4/B2 Resistance Seam Welding (22)

11UY0015-4/B3 Resistance Projection Welding (23)

11UY0015-4/B4 Flash Butt Welding (24)

11UY0015-4/B5 Upset Welding (25)

11UY0015-4/B6 High Frequency Resistance Welding (291)

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

**AUTOMATIC WELDING:** A welding operation in which allwork is done automatically

**METHOD TESTING:** To test a working welding system according to WPS

**FULLY MECHANIZED WELDING:** A welding operation in which all main procedures (apart from carrying work piece manually ) are performed automatically

**WELDING PROGRAMMING:** Programming of an approved welding procedure and/or of certain processes of welding equipment

**ROBOT WELDING:** Automatic welding operation carries out by means of a robot

**WELDIN MECHANISM:** All devicesused during a welding operation

**ISCO:** InternationalStandard Classification of Occupations

**WELDING PROCEDURE SPECIFICATION (WPS):** The document which defines variables necessary to ensure repeatability of a fusion by welding,

**PASS:** A single progression of welding along a joint,

**MANUFACTURER**: A contractor or its organization responsible for welding works

**TS:** Turkish Standards

 **TORCH:** A device which a welder holds and manages while welding in MIG, MAG and plasma welding methods,

**WELD HEAD:** A device which a welder holds and direct a welding process through in submerged welding methods.

**11UY0014-3/A1 QUALIFICATION UNIT FOR OCCUPATIONAL HEALTH AND SAFETY IN WELDIN OPERATIONS**

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| **1** | **NAME OF THE QUALIFICATION** | Al Occupational Health and Safety in Welding Operations |
| **2** | **REFERENCE CODE** | 11UY0014-3/A1 |
| **3** | **LEVEL** | 3 |
| **4** | **CREDIT VALUE** | - |
| **5** | **A) DATE OF PUBLICATION** | 12.07.2011 |
| **B) REVISION NO** | 00 |
| **C) REVISION DATE** | - |
| **6** | **OCCUPATIONAL STANDARD(S) TO FORM THE BASIS FOR THE QUALIFICATION UNIT** |
| TS EN ISO 9606-2 Qualification Testing for Welders –Fusion Welding -Chapter 2: Aluminum and aluminum alloys  |
| 7 | **LEARNING OUTCOMES** |
| **Learning outcome 1: To be have knowledge and skills in the field of occupational health and safety in welding operations**  |
| **Performance Criteria**1.1: To have information on basic first aid rules. 1.2: To be knowledgeable about legal requirements and rules at the work place regarding occupational health and safety 1.3: To implement emergency procedures in case of emergency 1.4: To be informed on fire risk and relevant measures to be taken 1.5: To know personal protection methods and to safely use protective equipment 1.6: To know how to safely assemble, adjust, turn off and maintain the relevant equipment 1.7: To have an overall idea on likely outcomes in the case of misapplication of welding operations and instructions 1.8: To be knowledgeable on safety measures to be taken in the case of gas land electricity leak and high electrical dangers 1.9: To know harmful effects of welding gas, smoke and radiation and how to protect against them 1.10: To know how important it is to ventilate a work environment 1.11: To know how to safely store, move and use gases 1.12: To know how to detect leaks out of a gas hose and connectors and use them safely **Learning Outcome 2: To define occupational safety related dangers and risks**  |
| **Performance Criteria**2.1: To define electrical and mechanical risks likely to come out during welding operations 2.2: To define risk to emerge out of welding smoke and gases during welding operations 2.3: To define noise and radiation related risks at a workplace 2.4: To define inflammable, combustible and explosive materials and take relevant measures at a welding work environment **Learning Outcome 3: To define effects of elements which pose risk to occupational health and safety**  |
| **Performance Criteria**3.1: To define areas of high level of electrical danger 3.2: To define effects of radiation, heat and splash likely to come out of an arc 3.3: To define negative effects likely to result from insufficient grounding and contact  |

**8 ASSESSMENT and EVALUATION**

**8 a) Theoretical Examination**

A theoretical examination can be in the form of either one of the below options:

(Tl) A multiple choice written test (of four choices)

(T2) An oral examination with open ended questions

Testing of professional knowledge includes learning outcomes of the qualification unit about welding process used in the qualification test. It is up to certification bodies to decide on Tl or T2 as a method. If a welder takes a theoretical examination, it will be mentioned on his qualification certificate. Each question (a total of 10 questions) of a Tl test is of about 2 to 2.5 minutes. The T2 consists of 3 questions.

**Performance Criteria:** In order to be successful in either T1 or T2 tests, a candidate shall get at least 50 points out of 100.

**8 b) Performance based Examination**

**8 c) Other Conditions for Assessment and Evaluation**

**10**

**11**

**QUALIFICATION DEVELOPMENT INSTITUTION(S)/ORGANIZATIONS(S)**

**SECTOR COMMITTEE TO VERIFY QUALIFICATION**

**DATE AND NUMBER OF APPROVAL BY VQA EXECUTIVE BOARD**

METAL SECTOR COMMITTEE

12.07.2011/2011-49

**11UY0015-4/B1 QUALIFICATION UNIT FOR RESISTANCE SPOT WELDING (21)**

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| **1** | **NAME OF THE QUALIFICATION** | RESISTANCE SPOT WELDING (21) |
| **2** | **REFERENCE CODE** | 11UY0015-4/B1 |
| **3** | **LEVEL** | 4 |
| **4** | **CREDIT VALUE** | - |
| **5** | **A) DATE OF PUBLICATION** | 12.07.2011 |
| **B) REVISION NO** | 00 |
| **C) REVISION DATE** | - |
| **6** | **OCCUPATIONAL STANDARD(S) TO FORM THE BASIS FOR THE QUALIFICATION UNIT** |
| TS EN 1418 Welding Personnel- Qualification testing for welding operators and resistance weld setters for fully mechanized and automatic fusion welding of metallic materials  |
| 7 | **LEARNING OUTCOMES** |
| **LEARNING OUTCOME 1: To do settings of resistance spot welding equipment**  |
| **Performance Criteria**1.1: To follow welding related procedures 1.2: To set welding equipment according to the approved Welding Procedure Specification (WPS) 1.3: To know the relation between parameter deviations and outcomes of welding operations 1.4: To detect any failure of welding equipment 1.5: To use weld bead gauges 1.6: To set control and surveillance systems of equipment 1.7: To know types of material and electrode, contact zone and how to fix electrode 1.8: To be knowledgeable about reasons of defects 1.9: To be knowledgeable about methods of inspection and application 1.10: To properly detect welding defects and their causes. 1.11: To take precautions against unforeseen events in a welding process **LEARNING OUTCOME 2: To define parent metals**  |
| **Performance Criteria**2.1: To define welding materials2.2: To be knowledgeable about preheating methods and control **Learning Outcome 3: To set resistance welding processes** |
| **Performance Criteria**3.1: To set the right electrode selection 3.2: To set cooling system. 3.3: To maintain equipment.  |

8

**ASSESSMENT and EVALUATION**

**8 a) Theoretical Examination**

A theoretical examination can be in the form of either one of the below options:

(Tl) A multiple choice written test (of four choices)

(T2) An oral examination with open ended questions

Testing of professional knowledge includes learning outcomes of the qualification unit about welding process used in the qualification test. It is up to certification bodies to decide on Tl or T2 as a method. If a welder takes a theoretical examination, it will be mentioned on his qualification certificate. Each question (a total of 10 questions) of a Tl test is of about 2 minutes. The T2 consists of 3 questions.

**Performance Criteria:** To get 50 points out of 100.

**8 b) Performance based Examination**

**Applied Examination:** (PI) A welding operator is asked to equipment programming in accordance with an approved Welding Procedure Specification (WPS). The examination shall cover learning outcomes.

**Assessment Material:** A checklist prepared according to variables mentioned in the 4th chapter of the TS EN 1418 standard and approved Welding Procedure Specification (WPS)

**Grading:** They are graded according to the criteria set on the checklist.

**Performance Criteria:** Tosucceed fully in all processes defined on the checklist.

**8 c) Other Conditions related to Assessment and Evaluation**

**10**

**11**

**QUALIFICATION DEVELOPMENT INSTITUTION(S)/ORGANISATIONS(S)**

**SECTOR COMMITTEE TO VERIFY QUALIFICATION**

**DATE AND NUMBER OF APPROVAL BY VQA EXECUTIVE BOARD**

METAL SECTOR COMMITTEE

12.07.2011/2011-49

**11UY0015-3/B2 QUALIFICATION UNIT FOR RESISTANCE SEAM WELDING (22)**

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| **1** | **NAME OF THE QUALIFICATION** | RESISTANCE SEAM WELDING (22) |
| **2** | **REFERENCE CODE** | 11UY0015-4/B2 |
| **3** | **LEVEL** | 4 |
| **4** | **CREDIT VALUE** | - |
| **5** | **A) DATE OF PUBLICATION** | 12.07.2011 |
| **B) REVISION NO** | 00 |
| **C) REVISION DATE** | - |
| **6** | **OCCUPATIONAL STANDARD(S) TO FORM THE BASIS FOR THE QUALIFICATION UNIT** |
| TS EN 1418 Welding Personnel- Qualification testing for welding operators and resistance weld setters for fully mechanized and automatic fusion welding of metallic materials |
| 7 | **LEARNING OUTCOMES** |
| **Learning Outcome 1: To do settings of resistance seam welding equipment**  |
| **Performance Criteria**1.1: To follow welding related procedures 1.2: To set welding equipment according to the approved Welding Procedure Specification (WPS) 1.3: To know the relation between parameter deviations and outcomes of welding operations 1.4: To detect any failure of welding equipment 1.5: To use weld bead gauges 1.6: To set control and surveillance systems of equipment 1.7: To know types of material and electrode, contact zone and how to fix electrode 1.8: To be knowledgeable about reasons of defects 1.9: To be knowledgeable about methods of inspection and application 1.10: To properly detect welding defects and their causes. 1.11: To take precautions against unforeseen events in a welding process **Learning Outcome 2: To define parent metals** |
| **Performance Criteria**2.1: To define welding materials2.2: To be knowledgeable about preheating methods and control **Learning Outcome 3: To set resistance seam welding equipment**  |
| **Performance Criteria**3.1: To set the right electrode selection3.2: To set cooling system.  3.3: To maintain equipment. |

8

**ASSESSMENT and EVALUATION**

**8 a) Theoretical Examination**

A theoretical examination can be in the form of either one of the below options:

(Tl) A multiple choice written test (of four choices)

(T2) An oral examination with open ended questions

Testing of professional knowledge includes learning outcomes of the qualification unit about welding process used in the qualification test. It is up to certification bodies to decide on Tl or T2 as a method. If a welder takes a theoretical examination, it will be mentioned on his qualification certificate. Each question (a total of 10 questions) of a Tl test is of about 2 to 2,5 minutes. The T2 consists of 3 questions.

**Performance Criteria:** In order to be successful in either T1 or T2 tests, a candidate shall get at least 50 points out of 100.

**8 b) Performance based Examination**

**Applied Examination:** (PI) A welding operator is asked to equipment programming in accordance with an approved Welding Procedure Specification (WPS). The examination shall cover learning outcomes.

**Assessment Material:** A checklist prepared according to variables mentioned in the 4th chapter of the TS EN 1418 standard and approved Welding Procedure Specification (WPS)

**Grading:** They are graded according to the criteria set on the checklist.

**Performance Criteria:** Tosucceed fully in all processes defined on the checklist.

**8 c) Other Conditions related to Assessment and Evaluation**

**10**

**11**

**QUALIFICATION DEVELOPMENT INSTITUTION(S)/ORGANISATION(S)**

**SECTOR COMMITTEE TO VERIFY QUALIFICATION**

**DATE AND NUMBER OF APPROVAL BY VQA EXECUTIVE BOARD**

METAL SECTOR COMMITTEE

12.07.2011/2011-49

**11UY0015-3/B3 QUALIFICATION UNIT FOR RESISTANCE PROJECTION WELDING (23)**

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| **1** | **NAME OF THE QUALIFICATION** | RESISTANCE PROJECTION WELDING (23) |
| **2** | **REFERENCE CODE** | 11UY0015-4B3 |
| **3** | **LEVEL** | 4 |
| **4** | **CREDIT VALUE** | - |
| **5** | **A) DATE OF PUBLICATION** | 12.07.2011 |
| **B) REVISION NO** | 00 |
| **C) REVISION DATE** | - |
| **6** | **OCCUPATIONAL STANDARD(S) TO FORM THE BASIS FOR THE QUALIFICATION UNIT** |
| TS EN 1418 Welding Personnel- Qualification testing for welding operators and resistance weld setters for fully mechanized and automatic fusion welding of metallic materials |
| 7 | **LEARNING OUTCOMES** |
| **Learning Outcome 1: To do settings of resistance projection welding equipment**  |
| **Performance Criteria**1.1: To follow welding related procedures 1.2: To set welding equipment according to the approved Welding Procedure Specification (WPS) 1.3: To know the relation between parameter deviations and outcomes of welding operations 1.4: To detect any failure of welding equipment 1.5: To use weld bead gauges 1.6: To set control and surveillance systems of equipment 1.7: To know types of material and electrode, contact zone and how to fix electrode 1.8: To be knowledgeable about reasons of defects 1.9: To be knowledgeable about methods of inspection and application 1.10: To properly detect welding defects and their causes. 1.11: To take precautions against unforeseen events in a welding process **Learning Outcome2: To define parent metals** |
| **Performance Criteria**2.1: To define welding materials2.2: To be knowledgeable about preheating methods and control **Learning Outcome3: To set resistance projection welding processes**  |
| **Performance Criteria**3.1: To set the right electrode selection3.2: To set cooling system.  3.3: To maintain equipment. |

**8**

**ASSESSMENT**

**8 a) Theoretical Examination**

A theoretical examination can be in the form of either one of the below options:

(Tl) A multiple choice written test (of four choices)

(T2) An oral examination with open ended questions

Testing of professional knowledge includes learning outcomes of the qualification unit about welding process used in the qualification test. It is up to certification bodies to decide on Tl or T2 as a method. If a welder takes a theoretical examination, it will be mentioned on his qualification certificate. Each question (a total of 10 questions) of a Tl test is of about 2 minutes. The T2 consists of 3 questions.

**Performance Criteria:** To get 50 points out of 100.

**8 b) Performance based Examination**

**Applied Examination:** (PI) A welding operator is asked to equipment programming in accordance with an approved Welding Procedure Specification (WPS). The examination shall cover learning outcomes.

**Assessment Material:** A checklist prepared according to variables mentioned in the 4th chapter of the TS EN 1418 standard and approved Welding Procedure Specification (WPS)

**Grading:** They are graded according to the criteria set on the checklist.

**Performance Criteria:** Tosucceed fully in all processes defined on the checklist.

**8 c) Other Conditions related to Assessment and Evaluation**

**10**

**11**

**QUALIFICATION DEVELOPMENT INSTITUTION(S)/ORGANISATION(S)**

**SECTOR COMMITTEE TO VERIFY QUALIFICATION**

**DATE AND NUMBER OF APPROVAL BY VQA EXECUTIVE BOARD**

METAL SECTOR COMMITTEE

12.07.2011/2011-49

**11UY0015-4/B4 QUALIFICATION UNIT FOR FLASH BUTT WELDING (24)**

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| **1** | **NAME OF THE QUALIFICATION** | FLASH BUTT WELDING (24) |
| **2** | **REFERENCE CODE** | 11UY0015-4/B4 |
| **3** | **LEVEL** | 4 |
| **4** | **CREDIT VALUE** | - |
| **5** | **A) DATE OF PUBLICATION** | 12.07.2011 |
| **B) REVISION NO** | 00 |
| **C) REVISION DATE** | - |
| **6** | **OCCUPATIONAL STANDARD(S) TO FORM THE BASIS FOR THE QUALIFICATION UNIT** |
| TS EN 1418 Welding Personnel- Qualification testing for welding operators and resistance weld setters for fully mechanized and automatic fusion welding of metallic materials |
| 7 | **LEARNING OUTCOMES** |
| **Learning Outcome 1: To do settings of flash butt welding equipment**  |
| **Performance Criteria**1.1: To follow welding related procedures 1.2: To set welding equipment according to the approved Welding Procedure Specification (WPS) 1.3: To know the relation between parameter deviations and outcomes of welding operations 1.4: To detect any failure of welding equipment 1.5: To use weld bead gauges 1.6: To set control and surveillance systems of equipment 1.7: To know types of material and electrode, contact zone and how to fix electrode 1.8: To be knowledgeable about reasons of defects 1.9: To be knowledgeable about methods of inspection and application 1.10: To properly detect welding defects and their causes. 1.11: To take precautions against unforeseen events in a welding process **Learning Outcome 2: To define parent metals** |
| **Performance Criteria**2.1: To define welding materials2.2: To be knowledgeable about preheating methods and control **Learning Outcome 3: T define flash butt welding processes**  |
| **Performance Criteria**3.1: To set the right electrode selection3.2: To set cooling system.  3.3: To maintain equipment. |

8

**ASSESSMENT and EVALUATION**

**8 a) Theoretical Examination**

A theoretical examination can be in the form of either one of the below options:

(Tl) A multiple choice written test (of four choices)

(T2) An oral examination with open ended questions

Testing of professional knowledge includes learning outcomes of the qualification unit about welding process used in the qualification test. It is up to certification bodies to decide on Tl or T2 as a method. If a welder takes a theoretical examination, it will be mentioned on his qualification certificate. Each question (a total of 10 questions) of a Tl test is of about 2 minutes. The T2 consists of 3 questions.

**Performance Criteria:** To get 50 points out of 100.

**8 b) Performance based Examination**

**Applied Examination:** (PI) A welding operator is asked to equipment programming in accordance with an approved Welding Procedure Specification (WPS). The examination shall cover learning outcomes.

**Assessment Material:** A checklist prepared according to variables mentioned in the 4th chapter of the TS EN 1418 standard and approved Welding Procedure Specification (WPS)

**Grading:** They are graded according to the criteria set on the checklist.

**Performance Criteria:** Tosucceed fully in all processes defined on the checklist.

**8 c) Other Conditions related to Assessment and Evaluation**

**10**

**11**

**QUALIFICATION DEVELOPMENT INSTITUTION(S)/ORGANISATION(S)**

**SECTOR COMMITTEE TO VERIFY QUALIFICATION**

**DATE AND NUMBER OF APPROVAL BY VQA EXECUTIVE BOARD**

METAL SECTOR COMMITTEE

12.07.2011/2011-49

**11UY0015-4/ B5 QUALIFICATION UNIT FOR UPSET WELDING (25)**

|  |  |  |
| --- | --- | --- |
| **1** | **NAME OF THE QUALIFICATION** | UPSET WELDING (25) |
| **2** | **REFERENCE CODE** | 11UY0015-4/B5 |
| **3** | **LEVEL** | 4 |
| **4** | **CREDIT VALUE** | - |
| **5** | **A) DATE OF PUBLICATION** | 12.07.2011 |
| **B) REVISION NO** | 00 |
| **C) REVISION DATE** | - |
| **6** | **OCCUPATIONAL STANDARD(S) TO FORM THE BASIS FOR THE QUALIFICATION UNIT** |
| TS EN 1418 Welding Personnel- Qualification testing for welding operators and resistance weld setters for fully mechanized and automatic fusion welding of metallic materials |
| 7 | **LEARNING OUTCOMES** |
| **Learning Outcome 1: To do settings of upset welding**  |
| **Performance Criteria**1.1: To follow welding related procedures 1.2: To set welding equipment according to the approved Welding Procedure Specification (WPS) 1.3: To know the relation between parameter deviations and outcomes of welding operations 1.4: To detect any failure of welding equipment 1.5: To use weld bead gauges 1.6: To set control and surveillance systems of equipment 1.7: To know types of material and electrode, contact zone and how to fix electrode 1.8: To be knowledgeable about reasons of defects 1.9: To be knowledgeable about methods of inspection and application 1.10: To properly detect welding defects and their causes. 1.11: To take precautions against unforeseen events in a welding process **Learning Outcome 2: To define parent metals** |
| **Performance Criteria**2.1: To define welding materials2.2: To be knowledgeable about preheating methods and control **Learning Outcome 3: To define upset welding processes**  |
| **Performance Criteria**3.1: To set the right electrode selection3.2: To set cooling system.  3.3: To maintain equipment. |

**8 ASSESSMENT and EVALUATION**

**8a) Theoretical Examination**

A theoretical examination can be in the form of either one of the below options:

(Tl) A multiple choice written test (of four choices)

(T2) An oral examination with open ended questions

Testing of professional knowledge includes learning outcomes of the qualification unit about welding process used in the qualification test. It is up to certification bodies to decide on Tl or T2 as a method. If a welder takes a theoretical examination, it will be mentioned on his qualification certificate. Each question (a total of 10 questions) of a Tl test is of about 2 to 2,5 minutes. The T2 consists of 3 questions.

**Performance Criteria:** To get 50 points out of 100.

**8b) Performance based Examination**

**Applied Examination:** (PI) A welding operator is asked to equipment programming in accordance with an approved Welding Procedure Specification (WPS). The examination shall cover learning outcomes.

**Assessment Material:** A checklist prepared according to variables mentioned in the 4th chapter of the TS EN 1418 standard and approved Welding Procedure Specification (WPS)

**Grading:** They are graded according to the criteria set on the checklist.

**Performance Criteria:** Tosucceed fully in all processes defined on the checklist.

**8c) Other Conditions related to Assessment and Evaluation**

**10**

11

**QUALIFICATION DEVELOPMENT INSTITUTION(S)/ORGANISATION(S)**

**SECTOR COMMITTEE TO VERIFY QUALIFICATION**

**DATE AND NUMBER OF APPROVAL BY VQA EXECUTIVE BOARD**

METAL SECTOR COMMITTEE

12.07.2011/2011-49

**11UY0015-4/ B6 QUALIFICATION UNIT FOR HIGH FREQUENCY RESISTANCE WELDING (291)**

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| **1** | **NAME OF THE QUALIFICATION** | High Frequency Resistance Welding (291) |
| **2** | **REFERENCE CODE** | 11UY0015-4/B6 |
| **3** | **LEVEL** | 4 |
| **4** | **CREDIT VALUE** | - |
| **5** | **A) DATE OF PUBLICATION** | 12.07.2011 |
| **B) REVISION NO** | 00 |
| **C) REVISION DATE** | - |
| **6** | **OCCUPATIONAL STANDARD(S) TO FORM THE BASIS FOR THE QUALIFICATION UNIT** |
| TS EN 1418 Welding Personnel- Qualification testing for welding operators and resistance weld setters for fully mechanized and automatic fusion welding of metallic materials |
| 7 | **LEARNING OUTCOMES** |
| **Learning Outcome 1: To do settings of high frequency resistance welding equipment**  |
| **Performance Criteria**1.1: To follow welding related procedures 1.2: To set welding equipment according to the approved Welding Procedure Specification (WPS) 1.3: To know the relation between parameter deviations and outcomes of welding operations 1.4: To detect any failure of welding equipment 1.5: To use weld bead gauges 1.6: To set control and surveillance systems of equipment 1.7: To know types of material and electrode, contact zone and how to fix electrode 1.8: To be knowledgeable about reasons of defects 1.9: To be knowledgeable about methods of inspection and application 1.10: To properly detect welding defects and their causes. 1.11: To take precautions against unforeseen events in a welding process **Learning Outcome 2: To define parent metals** |
| **Performance Criteria**2.1: To define welding materials2.2: To be knowledgeable about preheating methods and control **Learning Outcome 3: To set high frequency resistance welding processes**  |
| **Performance Criteria**3.1: To set the right electrode selection3.2: To set cooling system.  3.3: To maintain equipment. |

1 High Frequency Resistance Welding is defined as other resistance welding method in the TS EN 1418 standard.

**8 ASSESSMENT and EVALUATION**

**8a) Theoretical Examination**

A theoretical examination can be in the form of either one of the below options:

(Tl) A multiple choice written test (of four choices)

(T2) An oral examination with open ended questions

Testing of professional knowledge includes learning outcomes of the qualification unit about welding process used in the qualification test. It is up to certification bodies to decide on Tl or T2 as a method. If a welder takes a theoretical examination, it will be mentioned on his qualification certificate. Each question (a total of 10 questions) of a Tl test is of about 2 to 2,5 minutes. The T2 consists of 3 questions.

**Performance Criteria:** In order to be successful in either T1 or T2 tests, a candidate shall get at least 50 points out of 100.

**8b) Performance based Examination**

**Applied Examination:** (PI) A welding operator is asked to equipment programming in accordance with an approved Welding Procedure Specification (WPS). The examination shall cover learning outcomes.

**Assessment Material:** A checklist prepared according to variables mentioned in the 4th chapter of the TS EN 1418 standard and approved Welding Procedure Specification (WPS)

**Grading:** They are graded according to the criteria set on the checklist.

**Performance Criteria:** Tosucceed fully in all processes defined on the checklist.

**8c) Other Conditions related to Assessment and Evaluation**

**10**

**11**

**QUALIFICATION DEVELOPMENT INSTITUTION(S)/ORGANISATIONS(S)**

**SECTOR COMMITTEE TO VERIFY QUALIFICATION**

**DATE AND NUMBER OF APPROVAL BY VQA EXECUTIVE BOARD**

METAL SECTOR COMMITTEE

12.07.2011/2011-49