

**VQA**

NATIONAL QUALIFICATION 12UY0083-3 METAL CUTTER LEVEL 3

REVISION NO:00

VOCATIONAL QUALIFICATIONS AUTHORITY

Ankara, 2012

12UY0083-3 Metal Cutter

Date of Publication: 26/12/2012 Rev. No:00

PREFACE

This reference guide, namely the Metal Cutter (Level 3) National Qualification has been prepared in accordance with the 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 Ankara Chamber of Industry appointed upon the cooperation protocol signed on 22/05/2012. After opinions of the relevant organizations and institutions are received and assessed, necessary amendments are made on the draft. The final draft has been evaluated by the VQA’s Metal Sector Committee that has deemed it suitable. It has been approved by the Board of Directors of the VQA through its decision no 2012/73 of 10/10/2012 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.

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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:

1. Name and level of the qualification,
2. Aim of the qualification,
3. Occupational standard, occupational standard units/duties or qualification units that provide the basis for the qualification,
4. Requirements to take a qualifications test,
5. Learning outcomes and performance criteria per qualification unit,
6. Assessment and assessor's criteria to be implemented in the awarding of qualification
7. Conditions relating to the validity period of qualification certificate, renewal terms and supervision of certificate holder,
8. Institution and Sector Committee that respectively develop and approve the qualification.

National qualifications are built according to the relevant national occupational standards and/or to the relevant international occupational standards.

National Qualifications are set in cooperation with the bodies below:

* Formal and non-formal education and training institutions,
* Authorized certification bodies,
* Institutions having previously applied for authorization to the authority,
* Institutions having drawn up national occupational standard,
* Professional organizations

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12UY0083-3 METAL CUTTER NATIONAL QUALIFICATION

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| 1 | NAME OF THE QUALIFICATION | METAL CUTTER |
| 2 | REFERENCE CODE | 12UY0083-3 |
| 3 | LEVEL | 3 |
| 4 | INTERNATIONAL CLASSIFICATION CODE | ISCO 08: 7223 (Metal working machine tool setters and operators) |
| 5 | TYPE | - |
| 6 | CREDIT VALUE | - |
| 7 | A) DATE OF PUBLICATION | 10/10/2012 |
| B) REVISION NO | 00 |
| C) REVISION DATE | - |
| 8 | AIM | The qualification sets out the assessment principles for the knowledge and skill levels of the Metal Cutters (Level 3) who are expected to take occupational health and safety measures along with environmental safety measures, to prepare materials for cutting, to slice metal and to deal with after cutting processes. The qualification is prepared for the assessment and certification of labor qualifications in the metal cutting industry. |
| 9 | OCCUPATIONAL STANDARD(S) FORMING THE BASIS FOR THE QUALIFICATION | |
| 12U MS0237-3 METAL CUTTER NATIONAL OCCUPATIONAL STANDARD | | |
| 10 | REQUIREMENT(S) TO TAKE A QUALIFICATION TEST | |
| - | | |
| 11 | STRUCTURE OF THE QUALIFICATION | |
| 11-a) Mandatory Units | | |
| 12UY0083-3/A1 OCCUPATIONAL HEALTH AND SAFETY IN METAL CUTTING  12UY0083-3/A2 ENVIRONMENTAL PROTECTION LEGISLATION IN METAL CUTTING  12UY0083-3/A3 QUALITY MANAGEMENT IN METAL CUTTING | | |
| 11-b) Elective Units | | |
| 12UY0083-3/B1 SHEET CUTTING-SLICING  12UY0083-3/B2 UPCUT SHEAR CUTTING  12UY0083-3/B3 LASER CUTTING | | |

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| 12UY0083-3/B4 PLASMA CUTTING  12UY0083-3/B5 OXI-GAS CUTTING  12UY0083-3/B6 PROFILE CUTTING | | |
| 11-c) Alternatives for Grouping the Units and Additional Learning Outcomes | | |
| In order to obtain the qualification certificate, candidates must succeed at one of Group A and B qualification units. | | |
| 12 | ASSESSMENT | |
| 1. Candidates shall provide evidence to have following qualifications. Evidence indicate the fact that candidates:    1. Can perform all specified processes in line with the required standards,    2. Have necessary knowledge supporting his/her tasks,    3. Know why they are performing given tasks.    4. In the meantime candidates may acquire necessary skills in various ways. 2. In order to obtain the qualification certificate, one must succeed at the theoretical and performance based test of one of Group A and B qualification units. If a candidate fails in a unit or stage, s/he is eligible to retake the exam in a year for those units or stages s/he previously failed at. After a year failing candidates hall sit in both exams. | | |
| 13 | VALIDITY OF THE CERTIFICATE | Metal Cutter Qualification Certificate is valid for 5 years. |
| 14 | FREQUENCY OF SUPERVISION | Within the period of validity, an occupational qualification report is requested at least after a year upon certification. |
| 15 | ASSESSMENT METHODS TO BE FOLLOWED IN RENEWAL OF EXPIRED CERTIFICATES | Provided that the certificate holder certify at least a 12-month working history within last 5 years.  Sheet Metal Workbench qualification certificate is prolonged for 5 years upon performance test; otherwise the certified candidate shall take both exams once again.  After second 5-year period both theoretical and performance based tests are to be taken for renewal. |
| 16 | QUALIFICATION DEVELOPMENT INSTITUTION(S) | ANKARA CHAMBER OF INDUSTRY |
| 17 | SECTOR COMMITTEE TO VERIFY QUALIFICATION | METAL SECTORAL COMMITTEE |
| 18 | APPROVAL DATE AND NUMBER OF VQA's BOARD OF DIRECTORS | 10/10/2012 - 2012/73 |

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12UY0083-3/A1 OCCUPATIONAL HEALTH AND SAFETY QUALIFICATION UNIT IN METAL CUTTING

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| 1 | NAME OF THE QUALIFICATION UNIT | OCCUPATIONAL HEALTH AND SAFETY IN METAL CUTTING |
| 2 | REFERENCE CODE | 12UY0083-3/A1 |
| 3 | LEVEL | 3 |
| 4 | CREDIT VALUE | - |
| 5 | A) DATE OF PUBLICATION | 10/10/2012 |
| B) REVISION NO | 00 |
| C) REVISION DATE | - |
| 6 | OCCUPATIONAL STANDARD FORMING THE BASIS FOR THE QUALIFICATION UNIT | |
| MS0237-3 METAL CUTTER NATIONAL OCCUPATIONAL STANDARD | | |
| 7 | LEARNING OUTCOMES | |
| Learning Outcome 1: Applies general and company OHS rules.  Performance Criteria:  1.1: Lists basic rules related to OHS.  1.2: Identifies warning sign and boards related to work.  1.3: Explains suitable personal protective equipment, OHS protection and intervention tool functions for work and workspace.  1.4: Knows how to place suitable warning sign and boards for work in live with given instructions.  1.5: Has basic first aid knowledge.  Learning Outcome 2: Explains how to reduce risk factor.  Performance Criteria:  2.1: Explains flammable and combustible material management principles.  2.2: Explains flammable and combustible materials and their attributes.  2.3: Explains within the framework of work accidents, risk factors arising from metal cutting such as electricity, mechanic, gas, noise, radiance etc.  2.4. Has necessary knowledge over the elimination of accident and health risks.  Learning Outcome 3: Explains danger and emergency management methods.  Performance Criteria:  3.1: Explains instructions to be followed and how to act in case of a danger.  3.2: Explains how to act in case of a danger that one cannot respond or eliminate immediately.  3.3: Explains the emergency procedure related to the machines/tools with which one works.  3.4: Explains measures to be taken in case of a danger or emergency. | | |
| 8 | ASSESSMENT | |
| 8 a) Theoretical Examination | | |
| (T1) Multiple-choice examination: The exam is composed of 4 questions at least. The questions shall cover the learning outcomes related to the qualification unit and assess concerning cognitive components.  In order for candidates to succeed, they need to score at least 70/100 points in total. Maximum 2 minutes are given per question.  Performance criteria related to the qualification is assed by the attached elective performance test. | | |
| 8 b) Performance Based Examination | | |
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| 8 c) Other Conditions Related to Assessment | | |
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| 9 | QUALIFICATION DEVELOPMENT INSTITUTION(S) | ANKARA CHAMBER OF INDUSTRY |
| 10 | SECTOR COMMITTEE TO VERIFY QUALIFICATION | VQA METAL SECTORAL COMMITTEE |
| 11 | APPROVAL DATE AND NUMBER OF VQA's BOARD OF DIRECTORS | 10/10/2012 - 2012/73 |

ANNEXES

ANNEX [A1]-1: Information on Recommended Training for the Qualification Unit

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12UY0083-3/A2 ENVIRONMENTAL PROTECTION LEGISLATION FOR METAL CUTTING QUALIFICATION UNIT

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| 1 | NAME OF THE QUALIFICATION UNIT | ENVIRONMENTAL PROTECTION LEGISLATION FOR METAL CUTTING |
| 2 | REFERENCE CODE | 12UY0083-3/A2 |
| 3 | LEVEL | 3 |
| 4 | CREDIT VALUE | - |
| 5 | A) DATE OF PUBLICATION | 10/10/2012 |
| B) REVISION NO | 00 |
| C) REVISION DATE | - |
| 6 | OCCUPATIONAL STANDARD FORMING THE BASIS FOR THE QUALIFICATION UNIT | |
| MS0237-3 METAL CUTTER NATIONAL OCCUPATIONAL STANDARD | | |
| 7 | LEARNING OUTCOMES | |
| Learning Outcome 2: Describes the environmental protection standards and methods.  Performance Criteria:  1.1: Describes the environmental protection standards and methods.  1.2: Explains the importance of periodically participating in environmental protection trainings.  1.3: Explains the negative environmental effects and their harmful results that might occur at work.  Learning Outcome 2: Explains environmental risk reduction methods.  Performance Criteria:  2.1: Compares recyclable material sorting methods.  2.2: Explains the importance of sorting dangerous and harmful waste sorting and temporary storage principles taking necessary measures in accordance with instructions.  2.3: Identifies the suitable tools and equipment against leakage and pour for his/her work.  2.4: Classifies waste materials related to work which may constitute for environmental dangers.  2.5: Identifies personal protective equipment used at work and preparation period.  Learning Outcome 3: Explains the importance of efficient, effective and economical resource use.  Performance Criteria:  3.1: Explains how to efficiently and economically use resources.  3.2: Explains the importance of managing time efficiently.  3.3: Explains ways to efficient, effective and economical resource use.at work | | |
| 8 | ASSESSMENT | |
| 8 a) Theoretical Examination | | |
| (T1) Multiple-choice examination: The exam is composed of 4 questions at least. The questions shall cover the learning outcomes related to the qualification unit and assess concerning cognitive components.  In order for candidates to succeed, they need to score at least 70/100 points in total. Maximum 2 minutes are given per question.  Performance criteria related to the qualification is assed by the attached elective performance test. | | |
| 8 b) Performance Based Examination | | |
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| 8 c) Other Conditions Related to Assessment | | |
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| 9 | QUALIFICATION DEVELOPMENT INSTITUTION(S) | ANKARA CHAMBER OF INDUSTRY |
| 10 | SECTOR COMMITTEE TO VERIFY QUALIFICATION | VQA METAL SECTORAL COMMITTEE |
| 11 | APPROVAL DATE AND NUMBER OF VQA's BOARD OF DIRECTORS | 10/10/2012 - 2012/73 |

ANNEXES

ANNEX [A2]-1: Information on Recommended Training for the Qualification Unit

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12UY0083-3/A3 QUALITY MANAGEMENT SYSTEM FOR METAL CUTTING QUALIFICATION UNIT

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| 1 | NAME OF THE QUALIFICATION UNIT | QUALITY MANAGEMENT SYSTEM FOR METAL CUTTING QUALIFICATION UNIT |
| 2 | REFERENCE CODE | 12UY0083-3/A3 |
| 3 | LEVEL | 3 |
| 4 | CREDIT VALUE | - |
|  | A)DATE OF PUBLICATION | 10/10/2012 |
| 5 | B)REVISION NO | 00 |
|  | C) REVISION DATE | - |
| 6 | OCCUPATIONAL STANDARD FORMING THE BASIS FOR THE QUALIFICATION UNIT | |
| MS0237-3 METAL CUTTER NATIONAL OCCUPATIONAL STANDARD | | |
| 7 | LEARNING OUTCOMES | |
| Learning Outcome 1: Explains quality requirements related to work Performance Criteria  1.1: Finds and explains quality requirements according to allowed deviation and tolerances amongst options.  1.2: Analyzes machine, bench, tool, equipment or system quality requirements. | | |
| Learning Outcome 2: Identifies quality management methods  Performance Criteria:  2.1: Fills in concerning quality waste/loss forms.  2.2: Compares suitable quality management methods depending on the work. | | |
| Learning Outcome 3: Identifies quality management principles for work.  Performance Criteria:  3.1: Is conscious of the importance of participating in production quality control activates.  3.2: Identifies bench and machine setting conformity control methods.  3.3: Identifies technical feature conformity methods for processed materials.  3.4: Finds and explains production quality control activities amongst options | | |
| Learning Outcome 4: Explains given error and breakdown prevention procedures.  Performance Criteria:  4.1: Lists the cause of errors and breakdowns.  4.2: Explains the procedure for notifying superiors in case of errors and breakdowns beyond one's responsibility.  4.3: Explains error and breakdown management procedures to be follow. | | |
| 8 | ASSESSMENT | |
| 8 a) Theoretical Examination | | |
| (T1) Multiple-choice examination: The exam is composed of 4 questions at least. The questions shall cover the learning outcomes related to the qualification unit and assess concerning cognitive components. | | |
| In order for candidates to succeed, they need to score at least 70/100 points in total. Maximum 2 minutes are given per question. | | |
| Performance criteria related to the qualification is assed by the attached elective performance test. | | |

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| 8 b) Performance Based Examination | | |
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| 8 c) Other Conditions Related To Assessment | | |
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| 9 | QUALIFICATION DEVELOPMENT INSTITUTION(S) | ANKARA CHAMBER OF INDUSTRY |
| 10 | SECTOR COMMITTEE TO VERIFY QUALIFICATION | VQA METAL SECTORAL COMMITTEE |
| 11 | APPROVAL DATE AND NUMBER OF VQA's BOARD OF DIRECTORS | 10/10/2012 - 2012/73 |

APPENDIX

ANNEX [A3]-1: Information on Recommended Training for the Qualification Unit

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12UY0083-3/B1 SHEET CUTTING-SLICING QUALIFICATION UNIT

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| 1 | NAME OF THE QUALIFICATION UNIT | SHEET CUTTING-SLICING |
| 2 | REFERENCE CODE | 12UY0083-3/B1 |
| 3 | LEVEL | 3 |
| 4 | CREDIT VALUE | - |
|  | A) DATE OF PUBLICATION | 10/10/2012 |
| 5 | B) REVISION NO | 00 |
|  | C) REVISION DATE | - |
| 6 | OCCUPATIONAL STANDARD FORMING THE BASIS FOR THE QUALIFICATION UNIT | |
| MS0237-3 METAL CUTTER NATIONAL OCCUPATIONAL STANDARD | | |
| 7 | LEARNING OUTCOMES | |
| Learning Outcome 1: Surveys machine equipment operability.  Performance Criteria:  1.1: Checks equipment safety systems periodically in line with instructions.  1.2: Checks equipment operability periodically against corrosion and breakdown in line with instructions.  1.3: Repairs or changes faulty/broken parts if the equipment is under one's responsibility or notify authorized people if it is beyond one's responsibility.  1.4: Knows equipment specifications.  1.5: Identifies basic slicing and cutting terms. | | |
| Learning Outcome 2: Follows necessary procedures against breakdown and wear.  Performance Criteria:  2.1: Records breakdowns/wears and notify authorized persons  2.2: Notifies superiors for worn parts if the procedure is beyond one's responsibility.  2.3: Identifies equipment maintenance methods.  2.4: Knows the procedure for the equipment operating life of which is terminated. | | |
| Learning Outcome 3: Follows progressive maintenance procedures.  Performance Criteria:  3.1: Knows cleaning and maintenance supply storage methods and store them accordingly.  3.2: Maintains service-free equipment.  3.3: Minds operating life of equipment and notify superiors timely.  3.4: Checks fluid levels for hydraulic systems and make necessary changes in line with instructions.  3.5: Analyzes breakdown causes.  3.6: Identifies storage conditions for maintenance supplies.  3.7: Identifies service-free equipment maintenance principles. | | |
| Learning Outcome 4: Arranges the workspace.  Performance Criteria:  4.1: Arranges the workspace depending on the working method.  4.2: Responds to negative conditions in the workspace if needed.  4.3: Checks and makes necessary arrangements for non-processable materials or pieces. | | |
| Learning Outcome 5: Prepares work schedule.  Performance Criteria:  5.1: Estimates approximate production time depending on process attributes.  5.2: Prepares necessary form and documents before production and get the approval of the superiors if needed. | | |

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| 5.3: Identifies steps related to forms and documents to be prepared before production amongst options.  **Learning Outcome 6**: Checks measuring instruments.  **Performance Criteria:**  6.1: Identifies measuring instruments depending on the work and material type.  6.2: Checks the accuracy of measuring instruments.  6.3: Notifies superiors about faulty instruments and know calibration methods.  6.4: Knows how to keep and protect measuring instruments.  6.5. Knows measuring and control procedures. (tape measure, steel rule, caliper, gauge board, floating rule etc.)  **Learning Outcome 7**: Prepares necessary tools, kits, equipment and material.  **Performance Criteria:**  7.1: Prepares necessary tools, kits, equipment and material before work in line with given instructions.  7.2: Brings specified tools, kits, equipment and material to the workspace.  7.3: Determines blunt blades and notify authorized persons.  7.4: Determines measurement accuracy changes arising from change and wears and fixes the equipment under one's responsibility.  7.5: Records and check tag (width, length & quality) and roller information.  7.6: Picks determined materials from the storage unit for the cutting process in line with instructions received from superiors.  7.7: Piles the picked material to the workspace.  7.8: Collects order information related to materials to be cut/sliced.  7.9: Identifies specifications of materials to be cut.  **Learning Outcome 8**: Checks the machines, equipment and benches before use.  **Performance Criteria:**   1. Checks pneumatic/hydraulic system pieces periodically and notifies the authorized persons in case of a failure.    1. Performs leak tightness and fluid level checks in line with given instructions for hydraulic systems accompanied by superiors.    2. Performs leak tightness and fluid level checks in line with given instructions for pneumatic systems accompanied by superiors.   8.4: Identifies the working principles of pneumatic/hydraulic system pieces.  8.5: Analyzes leak tightness and fluid level check principles for hydraulic systems.  8.6: Analyzes leak tightness and fluid level check principles for pneumatic systems.  **Learning Outcome 9**: Prepares sheet cutting-slicing machines.  **Performance Criteria:**  9.1: Programs the cutting in accordance with the order information.  9.2: Sets cutting blades on the shafts according to slicing measures.  9.3: Adjusts cutting settings (feeler and/or drop distance) according to sheet thickness.  9.4: Makes necessary pressure and distance adjustments on straightening roll in accordance with sheet thickness and instructions.  9.5: Makes necessary adjustments to keep rectilinearity before deep-loop.  9.6: Prepares separators.  9.7: Prepares the tape winder according to the number of slices.  9.8: Prepares the wastage (chips) winder according to instructions.  9.9: Knows sheet cutting machine operation sequence and settings.  **Learning Outcome 10**: Places the material to be cut on the bench.  **Performance Criteria:**  10.1: Inspects the chosen material in order to see if it is physically suitable for cutting. (Manufacturing defects, surface roughness, waviness etc.)  10.2: Checks the dimensions of the material using suitable instruments (tape measure, steel rule, caliper etc.) in accordance with the production drawing.  10.3: Places the chosen material on the cutting table minding reference points. |

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| 10.4: Places the roll on the machine using a lifter for cutting/slicing process.  10.5: Knows operation sequence and process features for placing the material on the machine. | |
| Learning Outcome 11: Prepares the material on cutting bench to be cut  Performance Criteria:  11.1: Unrolls the roll using suitable tools and machines.  11.2: Smoothens the straightening roll and the tip of the roll to facilitate cutting.  11.3: Places the tip of the role on the part where it will be cut using the control board.  11.4: Loops the sliced sheet into the deep-loop against stretching in the line.  11.5: Checks roll pressure settings while the sheet coming out of the loop passes through the roll.  11.6: Follows necessary procedure to prepare the material placed on the bench for cutting process. | |
| Learning Outcome 12: Cuts-slice materials.  Performance Criteria:  12.1: Starts controlled roll cutting process on the production line.  12.2: Places the pieces which are cut on the separator.  12.3: Completes sample cutting and check the piece using suitable materials (tape measure, steel rule, caliper, floating rule etc.)  12.4: Starts tape winder for sliced sheets.  12.5: Starts/carries out cutting process swiftly.  12.6: Knows cutting-slicing process operation sequence and features. | |
| Learning Outcome 13: Arranging the material cutting/slicing process of which is completed.  Performance Criteria:  13.1: Caps/bales piece ends properly after the process.  13.2: Tags rolls according to standards.  13.3: Places rolls on the dispatching area using a lifter.  13.4: Removes chips off the loop using appropriate methods.  13.5: Knows and follows necessary procedures at the end of cutting-slicing process (tagging, baling, placing rolls on the dispatching area etc.)  13.6: Knows and takes suitable measures for cutting faults. | |
| 8 | ASSESSMENT |
| 8 a) Theoretical Examination | |
| (T1) Multiple choice exam is composed of at least 15 questions  (T2) Theoretical examination is composed of minimum 3 open-ended questions along with at least 10 multiple-choice questions. | |
| In order for candidates to succeed at T1 or T2 examinations, they need to score at least 60/100 points in total. Maximum 2 minutes are given per question. For each open-ended question, maximum 4 minutes are given. | |
| One of T1 or T2 examination methods can be applied. | |
| 8 b) Performance Based Examination | |
| (P1) Performance based examination  The examination is performed under real production conditions bearing a production drawing that serves as the basis for sheet cutting in mind. Test duration is calculated based on cutting process duration performed under real work environment.  Durin(P1) performance based examination, the candidate shall follow each step successfully specified in the checklist. The checklist shall cover each learning outcome. | |

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| 8 c) Other Conditions Related to Assessment | | |
| If a candidate fails in P1 examination, s/he is eligible to retake the exam in 6 months for those learning outcomes s/he previously failed at. | | |
| 9 | QUALIFICATION DEVELOPMENT INSTITUTION(S) | ANKARA CHAMBER OF INDUSTRY |
| 10 | SECTOR COMMITTEE TO VERIFY QUALIFICATION | VQA METAL SECTORAL COMMITTEE |
| 11 | APPROVAL DATE AND NUMBER OF VQA's BOARD OF DIRECTORS | 10/10/2012 - 2012/73 |

ANNEXES

ANNEX [B1]-1: Information on Recommended Training for the Qualification Unit

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12UY0083-3/B2 UPCUT SHEAR CUTTING QUALIFICATION UNIT

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| 1 | NAME OF THE QUALIFICATION UNIT | UPCUT SHEAR CUTTING |
| 2 | REFERENCE CODE | 12UY0083-3/B2 |
| 3 | LEVEL | 3 |
| 4 | CREDIT VALUE | - |
|  | A) DATE OF PUBLICATION | 10/10/2012 |
| 5 | B) REVISION NO | 00 |
|  | C) REVISION DATE | - |
| 6 | OCCUPATIONAL STANDARD FORMING THE BASIS FOR THE QUALIFICATION UNIT | |
| MS0237-3 METAL CUTTER NATIONAL OCCUPATIONAL STANDARD | | |
| 7 | LEARNING OUTCOMES | |
| Learning Outcome 1: Surveys equipment operability.  Performance Criteria:  1.1: Checks equipment safety systems periodically in line with instructions.  1.2: Checks equipment operability periodically against wear and breakdown in line with instructions.  1.3: Repairs or changes faulty/broken parts if the equipment is under one's responsibility or notify authorized people if the procedure is beyond one's responsibility.  1.4: Knows the equipment attributes.  1.5: Knows the basic terms related to upcut shear cutting. | | |
| Learning Outcome 2: Follows necessary procedures against breakdown and wear.  Performance Criteria:  2.1: Records inconveniences such as breakdowns/wears and notify authorized persons.  2.2: Notifies superiors for parts operating life of which is terminated if maintenance and changing procedure is beyond one's responsibility.  2.3: Identifies equipment maintenance methods.  2.4: Knows the procedure for the equipment operating life of which is terminated. | | |
| Learning Outcome 3: Follows progressive maintenance procedures.  Performance Criteria:  3.1: Stores cleaning and maintenance supplies properly.  3.2: Maintains service-free equipment.  3.3: Minds operating life of equipment and notify superiors timely.  3.4: Checks fluid levels for hydraulic systems and make necessary changes in line with instructions.  3.5: Analyzes breakdown causes.  3.6: Identifies storage conditions for maintenance supplies.  3.7: Identifies service-free equipment maintenance principles.  Learning Outcome 4: Arranges the workspace.  Performance Criteria:  4.1: Arranges the workspace depending on the working method.  4.2: Responds to negative conditions in the workspace.  4.3: Organizes and keeps non-processable materials under control.  4.4: Lays down working principles for the workspace depending on working method. | | |

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| **Learning Outcome 5: Prepares work schedule.**  **Performance Criteria:**  5.1: Estimates approximate production time depending on process attributes and notify superiors if needed.  5.2: Prepares necessary form and documents before production and receive the approval of superiors if needed.  5.3: Identifies steps related to forms and documents to be prepared before production amongst options.  **Learning Outcome 6: Checks measuring instruments.**  **Performance Criteria:**  6.1: Identifies measuring instruments depending on the work and material type.  6.2: Checks the accuracy of measuring instruments.  6.3: Notifies superiors about faulty instruments and know the calibration methods.  6.4: Knows and follow the procedure for keeping and protecting measuring instruments.  6.5: Knows measuring and control methods (tape measure, steel rule, caliper, gauge board, floating rule etc.).  **Learning Outcome 7: Prepares necessary tools, kits, equipment and material.**  **Performance Criteria:**  7.1: Appoints necessary tools, kits, equipment and material before work in line with instructions.  7.2: Brings specified tools, kits, equipment and material to the workspace.  7.3: Determines blunt blades.  7.4: Determines measurement accuracy changes arising from change and wears and fixes the equipment if the procedure is under one's responsibility.  7.5: Picks determined materials from the storage unit in line with instructions.  7.6: Piles the picked material to the workspace.  7.7: Identifies material specifications.  **Learning Outcome 8: Checks machines, equipment and benches before use.**  **Performance Criteria:**  8.1: Checks pneumatic/hydraulic system pieces periodically and notifies the authorized persons in case of a failure.  8.2: Performs leak tightness and fluid level checks for hydraulic systems.  8.3: Performs leak tightness and pressure checks for pneumatic systems..  8.4: Identifies the working principles of pneumatic/hydraulic system pieces.  8.5: Analyzes leak tightness and fluid level check principles for hydraulic systems in line with instructions.  8.6: Analyzes leak tightness and fluid level check principles for pneumatic systems in line with instructions.  **Learning Outcome 9: Adjusts upcut shear.**  **Performance Criteria:**  9.1: Adjusts manual cutting distance settings (feeler) or machine settings in accordance with material type and thickness.  9.2: Checks feeler setting accuracy after sample cut.  9.3: Adjust cutting measurement gage setting manually or using software.  9.4: Knows necessary setting features for upcut shear cutting (gage, manual, software settings etc.)  9.5: Knows upcut shear attributes.  **Learning Outcome 10: Places the piece to be cut on the bench.**  **Performance Criteria:**  10.1: Inspects the chosen material in order to see if it is physically suitable for cutting. (Manufacturing defects, surface roughness, waviness etc.)  10.2: Checks the dimensions of the material using suitable instruments (tape measure, steel rule, caliper etc.) in accordance with the production drawing. |

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| 10.3: Places the chosen material on the cutting table minding reference points.  10.4: Knows physical check and control principles for the material to be cut..  10.5: Knows operation sequence and process features for placing the material on the machine.  10.6: Knows measuring instrument attributes.  **Learning Outcome 11**:Marks materials.  **Performance Criteria:**  11.1: Prepares surfaces on which marks will be placed.  11.2: Marks pieces using suitable measuring and marking tools (steel rule, caliper, tape, scribber etc.) in accordance with the production drawing.  11.3: Checks marked piece measurement compliance to the production drawing.  11.4: Knows marking methods.  11.5: Knows marking tools.  **Learning Outcome 12**: Performs upcut shear cutting process.  **Performance Criteria:**  12.1: Makes gage and angle adjustments in line with the cutting measurements specified in the production drawing using suitable measuring instruments (steel rule, rule, goniometer, caliper, micrometer etc.).  12.2: Adjusts miter if angle is not accurate.  12.3: Cuts the material.  12.4: Checks the angles and measurements of the first piece that is cut using suitable measuring tools and makes necessary adjustments in case of deviation.  12.5: Monitors cutting processes for multiple-cuttings and check measurements periodically using suitable tools.  12.6: Knows upcut shear cutting process operation sequence and features.  12.7: Interprets after-cutting/slicing process (angle, measurement checks, deviation adjustment etc.).  **Learning Outcome 13**: Checks the pieces that are cut.  **Performance Criteria:**  13.1: Examines the piece manually and visually for inconveniences such as burr and roughness.  13.2: Checks processed pieces according to given standards and production drawing using suitable measuring instruments (steel rule, rule, caliper, goniometer, micrometer etc.).  13.3: Places pieces that are cut on the control/dispatch area adopting suitable methods.  13.4: Bales and/or piles default-free pieces in line with instructions.  13.5: Knows cutting faults and suitable measure that can be taken.  **Learning Outcome 14**: Cleans the equipment and workspace after cutting process.  **Performance Criteria:**  14.1: Keeps the workspace clean and tidy to prevent any interruption that may occur in the work organization.  14.2: Cleans and returns the equipment, measurement instruments and kits once the work is done.  14.3: Follows given instructions on using substances which are harmful to the environment and health, and store these substances accordingly.  14.4: Knows cleaning methods for the machines and equipment which are in use.  **Learning Outcome 15**: Dispatches and reports.  **Performance Criteria:**  15.1: Dispatches materials to concerning unit for secondary process.  15.2: Tags pieces that will not be processed again.  15.3: Knows the procedure for the pieces that will or will not go through secondary process. |

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ANNEXES

ANNEX [B2]-1: Information on Recommended Training for the Qualification Unit

**Content of Training:**

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| 8 | ASSESSMENT | |
| 8 a) Theoretical Examination | | |
| (T1) Multiple choice exam is composed of at least 15 questions  (T2) Theoretical examination composed of minimum 3 open-ended questions. | | along with at least 10 multiple choice questions. |
| In order for candidates to succeed at T1 or T2 examinations, they need to score at least 60/100 points in total. Maximum 2 minutes are given per question. For each open-ended question, maximum 4 minutes are given. | | |
| One of T1 or T2 examination methods can be applied. | |  |
| 8 b) Performance Based Examination | | |
| (P1) Performance based examination | |  |
| The test is performed under real production conditions bearing a production drawing which serves as the basis for upcut shear cutting in mind. Test duration is calculated based on cutting process duration performed under real work environment. | | |
| During (P1) performance test, the candidate shall follow each step successfully described in the checklist. The checklist shall cover all learning outcomes. | | |
| 8 c) Other Conditions Related To Assessment | | |
| If a candidate fails in P1 examination, s/he is eligible to retake the exam in 6 months for those learning outcomes s/he previously failed at. | | |
| 9 | QUALIFICATION DEVELOPMENT INSTITUTION(S) | ANKARA CHAMBER OF INDUSTRY |
| 10 | SECTOR COMMITTEE TO VERIFY QUALIFICATION | VQA METAL SECTOR COMMITTEE |
| 11 | APPROVAL DATE AND NUMBER OF VQA's BOARD OF DIRECTORS | 10/10/2012 - 2012/73 |

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12UY0083-3/B3 LASER CUTTING QUALIFICATION UNIT

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| 1 | NAME OF THE QUALIFICATION UNIT | LASER CUTTING |
| 2 | REFERENCE CODE | 12UY0083-3/B3 |
| 3 | LEVEL | 3 |
| 4 | CREDIT VALUE | - |
| 5 | A) DATE OF PUBLICATION | 10/10/2012 |
| B) REVISION NO | 00 |
| C) REVISION DATE | - |
| 6 | OCCUPATIONAL STANDARD FORMING THE BASIS FOR THE QUALIFICATION UNIT | |
| MS0237-3 METAL CUTTER NATIONAL OCCUPATIONAL STANDARD | | |
| 7 | LEARNING OUTCOMES | |
| Learning Outcome 1: Surveys machine equipment operability.  Performance Criteria:  1.1: Checks equipment safety systems periodically in line with instructions.  1.2: Checks equipment operability periodically against wear and breakdown in line with instructions.  1.3: Notifies authorized people for the change or repair of faulty/broken parts on maintenance.  1.4: Knows equipment specifications.  1.5: Identifies basic terms related to laser cutting.  Learning Outcome 2: Records breakdowns/wears and notify authorized persons.  Performance Criteria:  2.1: Notifies authorized persons about inconveniences such as breakdowns/wears.  2.2: Notifies superiors for parts operating life of which is terminated if maintenance and changing procedure is beyond one's responsibility.  2.3: Identifies equipment maintenance methods.  2.4: Knows the procedure for the equipment operating life of which is terminated.  Learning Outcome 3: Follows progressive maintenance procedures.  Performance Criteria:  3.1: Stores maintenance supplies properly.  3.2: Maintains service-free equipment.  3.3: Checks fluid levels for hydraulic systems and make necessary changes in line with instructions.  3.4: Analyzes breakdown causes.  3.5: Identifies storage conditions for maintenance supplies.  3.6: Identifies service-free equipment maintenance principles.  Learning Outcome 4: Arranges the workspace.  Performance Criteria:  4.1: Arranges the workspace depending on the working method.  4.2: Responds to negative conditions in the workspace if needed.  4.3: Controls and make necessary arrangements for non-processable materials or pieces.  4.4: Lays down working principles for the workspace depending on working method.  Learning Outcome 5: Prepares work schedule.  Performance Criteria:  5.1: Gets instructions, production drawing and orders about the process and production program from superiors.  5.2: Sets out production sequence examining instructions, production drawing and orders. | | |

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| **Learning Outcome 6: Checks measuring instruments.**  **Performance Criteria:**  6.1: Identifies measuring instruments depending on the work and material type.  6.2: Checks the accuracy of measuring instruments.  6.3: Notifies superiors about faulty instruments and knows the calibration methods.  6.4: Knows and follows the procedure for keeping and protecting measuring instruments.   1. Knows measuring and control procedures. (tape measure, steel rule, caliper, floating rule etc.)   **Learning Outcome 7: Prepares necessary tools, kits, equipment and material.**  **Performance Criteria:**  7.1: Appoints necessary tools, kits, equipment and material before work in line with instructions.  7.2: Brings determined tools, kits, equipment and material to the workspace.  7.3: Determines worn pieces and fixes or notifies authorized persons if needed.  7.4: Determines measurement accuracy changes arising from change (nozzle, lens, protective gear change etc.) and wears, and makes necessary adjustments after getting permission.  7.5: Identifies material specifications.  7.6: Piles the chosen material on the cutting place.  **Learning Outcome 8: Checks machines, equipment and benches before use.**  **Performance Criteria:**  8.1: Checks both laser and cutting gas pressure for laser cutting machine.  8.2: Knows flammable and combustible gases.  8.3: Stores and changes empty gas cylinders in line with OHS rules.  8.4: Recognizes flammable and combustible gas cylinders by their features.  **Learning Outcome 9: Sets laser cutting machines parameters.**  **Performance Criteria:**  9.1: Sets laser cutting machine parameters.  9.2: Fixes suitable nozzle and lens on the machine.  9.3: Knows principles for choosing suitable lens and nozzle conforming to parameter settings.  **Learning Outcome 10: Adjusts the chosen nozzle and lens.**  **Performance Criteria:**  10.1: Centers the nozzle and make necessary adjustments.  10.2: Adjusts the focal point depending on the lens and material thickness.  10.3: Knows/applies nozzle and lens adjustment principles.  **Learning Outcome 11: Places the piece to be cut on the bench.**  **Performance Criteria:**  11.1: Inspects the chosen material in order to see if it is physically suitable for cutting (manufacturing defects, surface roughness, waviness etc.).  11.2: Knows measuring instrument attributes.  11.3: Checks the dimensions of the material using suitable instruments (tape measure, steel rule, caliper etc.) in accordance with the production drawing.  11.4: Makes necessary adjustments (reference point settings) in accordance with measurements for the cutting.  11.5: Places the chosen material on the cutting bench minding reference points.  11.6: Knows physical check and control principles for the material to be cut..  11.7: Knows/applies operation sequence for placing the material on the machine.  **Learning Outcome 12: Performs laser cutting process.**  **Performance Criteria:**  12.1: Starts cutting process  12.2: Knows laser cutting machine features.  12.3: Monitors the cutting process and notify superiors in case of a problem.  12.4: Performs visual check for the first piece that is cut.  12.5: Checks the measures and angles of the piece using suitable materials (steel rule, rule, caliper etc.)  12.6: Informs superiors about revised situations occurred during production. |

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| 12.7: Knows laser cutting process operation sequence and features.  Learning Outcome 1: Cleans the pieces that are cut.  Performance Criteria:  13.1: Cleans the scrap off cut pieces.  13.2: Cleans the cutting residue off the piece.  13.3: Is aware of the cleaning works.  Learning Outcome 14: Checks the pieces that are cut.  Performance Criteria:  14.1: Examines the piece manually and visually for inconveniences such as burr and roughness.  14.2: Checks processed pieces according to given standards and production drawing using suitable measuring instruments (steel rule, caliper, goniometer, caliper, micrometer etc.).  14.3: Sorts waste and materials to be re-processed depending on defects.  14.4: Places pieces that are cut on the control/dispatch area adopting suitable methods.  14.5: Bales and/or piles fault-free pieces in line with instructions.  14.6: Identifies cutting faults and suitable measures that can be taken..  14.7: Analyzes the causes of after-cut faults.  Learning Outcome 15: Cleans the equipment and workspace after cutting process.  Performance Criteria:  15.1: Keeps the workspace clean and tidy to prevent any interruption that may occur in the work organization.  15.2: Cleans and return the equipment, measurement instruments and kits once the work is done.  14.3: Follows given instructions on using substances which are harmful to the environment and health, and store these substances accordingly.  15.4: Recognizes cleaning methods for the machines and equipment which are in use.  Learning Outcome 16: Dispatches and reports  Performance Criteria:  16.1: Dispatches materials to concerning unit for secondary process.  16.2: Tags pieces that will not be processed again.  16.3: Knows the procedure for the pieces which will or will not go through secondary process. | |
| 8 | ASSESSMENT |
| 8 a) Theoretical Examination | |
| (T1) Multiple choice exam is composed of at least 15 questions  (T2) Theoretical examination is composed of minimum 3 open-ended questions along with at least 10 multiple-choice questions.  In order for candidates to succeed at T1 or T2 examinations, they need to score at least 60/100 points in total. Maximum 2 minutes are given per question. For each open-ended question, maximum 4 minutes are given.  One of T1 or T2 examination methods can be applied. | |
| 8 b) Performance Based Examination | |
| (P1) Performance based examination  The test is performed under real production conditions bearing a production drawing which serves as the basis for laser cutting in mind. Performance based examination duration is calculated based on cutting process duration performed under real work environment.  During (P1) performance-based examination, the candidate shall follow each step successfully specified in the checklist. The checklist shall cover each learning outcome. | |
| 8 c) Other Conditions Related To Assessment | |
| If a candidate fails in P1 examination, s/he is eligible to retake the exam in 6 months for those learning outcomes s/he previously failed at. | |

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| 9 | QUALIFICATION DEVELOPMENT INSTITUTION(S) | ANKARA CHAMBER OF INDUSTRY |
| 10 | SECTOR COMMITTEE TO VERIFY QUALIFICATION | VQA METAL SECTORAL COMMITTEE |
| 11 | APPROVAL DATE AND NUMBER OF VQA's BOARD OF DIRECTORS | 10/10/2012 - 2012/73 |

ANNEXES

ANNEX [B3]-1: Information on Recommended Training for the Qualification Unit

**Content of Training:**

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12UY0083-3/B4 PLASMA CUTTING QUALIFICATION UNIT

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| --- | --- | --- |
| 1 | NAME OF THE QUALIFICATION UNIT | PLASMA CUTTING |
| 2 | REFERENCE CODE | 12UY00-3/B4 |
| 3 | LEVEL | 3 |
| 4 | CREDIT VALUE | - |
| 5 | A)DATE OF PUBLICATION | 10/10/2012 |
| B)REVISION NO | 00 |
| C) REVISION DATE | - |
| 6 | OCCUPATIONAL STANDARD FORMING THE BASIS FOR THE QUALIFICATION UNIT | |
| MS0237-3 METAL CUTTER NATIONAL OCCUPATIONAL STANDARD | | |
| 7 | LEARNING OUTCOMES | |
| **Learning Outcome 1: Surveys equipment operability.**  **Performance Criteria:**  1.1: Checks equipment safety systems periodically in line with instructions.  1.2: Checks equipment operability periodically against wear and breakdown in line with instructions.  1.3: Notifies authorized people for the change or repair of faulty/broken parts on maintenance.  1.4: Knows equipment specifications.  1.5: Identifies basic terms related to plasma cutting.  **Learning Outcome 2:** Records breakdowns/wears and notifies authorized persons.  **Performance Criteria:**   1. : Notifies authorized persons about inconveniences such as breakdowns/wears. 2. : Notifies superiors for worn parts if the procedure is beyond one's responsibility. 3. : Identifies equipment maintenance methods.   2.4: Knows the procedure to be followed for the equipment operating life of which is terminated.  **Learning Outcome 3:** Follows progressive maintenance procedures.  **Performance Criteria:**  3.1: Stores maintenance supplies properly.  3.2: Maintains service-free equipment under one's responsibility.  3.3: Checks and maintains compressors and air dryers system in line with instructions.  3.4: Analyzes breakdown causes.  3.5: Identifies storage conditions for maintenance supplies.  3.6: Identifies service-free equipment maintenance principles.  **Learning Outcome 4:** Arranges the workspace.  **Performance Criteria:**  4.1: Arranges the workspace depending on the working method.  4.2: Responds to negative conditions in the workspace.  4.3: Organizes and keep non-processable materials under control.  4.4: Lays down working principles for the workspace depending on working method.  **Learning Outcome 5: Prepares work schedule.**  **Performance Criteria:**  5.1: Gets instructions, production drawing and orders about the process and production program form the superiors.  5.2: Sets out production steps and sequence examining instructions, production drawing and orders. | | |

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| Learning Outcome 6: Checks measuring instruments.  Performance Criteria:  6.1: Identifies measuring instruments depending on the work and material type.  6.2: Checks the accuracy of measuring instruments.  6.3: Notifies superiors about faulty instruments and know the calibration methods.  6.4: Knows and follow the procedure for keeping and protecting measuring instruments.  6.5: Knows measuring and control procedures. (tape measure, steel rule, gauge board, caliper, floating rule etc.)  Learning Outcome 7: Prepares necessary tools, kits, equipment and material.  Performance Criteria:  7.1: Appoints necessary tools, kits, equipment and material before work in line with instructions.  7.2: Brings determined tools, kits, equipment and material to the workspace.  7.3: Determines worn pieces and fix if the procedure is under one’s responsibility or notifies authorized persons if needed.  7.4: Determines measurement accuracy changes arising from changes (nozzle, lens, protective gear change etc.) and wears, and make necessary adjustments after getting permission.  7.5: Identifies specifications of materials to be cut.  7.6: Places and piles the chosen materials on the cutting place.  Learning Outcome 8: Checks machines, equipment and benches before use.  Performance Criteria:  8.1: Checks the compressor’s air pressure conformity to operating pressure  8.2: Checks cutting gases for plasma cutting/  8.3: Stores and changes empty gas cylinders in line with OHS rules.  8.4: Knows flammable and combustible gases.  8.5: Recognizes flammable and combustible gas cylinders by their features.  Learning Outcome 9: Adjusts parameter settings on the plasma-cutting machine.  Performance Criteria:  9.1: Picks the parameter file in accordance with the material thickness and type.  9.2: Applies the chosen parameter file on the cutting program.  9.3: Places suitable nozzle, protective gear and electrode on the torch.  9.4: Identifies plasma cutting machine parameter settings.  9.5: Interprets principles for choosing nozzle, protective gear and electrode suitable for parameter settings.  9.6: Identifies principles for picking current value, torch height and cutting gas pressure on the concerning table depending on the material thickness.  Learning Outcome 10: Places the piece to be cut on the bench.  Performance Criteria:  10.1: Inspects the chosen material in order to see if it is physically suitable for cutting. (manufacturing defects, surface roughness, waviness etc.)  10.2: Knows the features of measuring instruments to be used.  10.3: Checks the dimensions of the material using suitable instruments (tape measure, steel rule, caliper, etc.) in accordance with the production drawing.  10.4: Makes necessary adjustments (reference point settings) in accordance with measurements for the cutting.  10.5: Places the chosen material on the cutting bench minding reference points.  10.6: Knows physical check and control principles for the material to be cut..  10.7: Knows and applies operation sequence for placing the material on the machine.  Learning Outcome 11: Performs plasma-cutting process.  Performance Criteria:  11.1: Starts cutting process  11.2: Monitors the cutting process and notify superiors in case of a problem. |

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| 11.3: Knows plasma cutting machine features.  11.4: Performs visual check for the first piece that is cut.  11.5: Checks the measures and angles of the piece using suitable materials (steel rule, rule, caliper etc.)  11.6: Informs superiors about revised situations occurred during production.  11.7: Knows plasma cutting process operation sequence and features.  **Learning Outcome 12**: Cleans the pieces that are cut.  **Performance Criteria:**  12.1: Cleans the scrap off the pieces that are cut.  12.2: Cleans the cutting residue off the piece.  12.3: Is aware of the cleaning works.  **Learning Outcome 1**: Checks the pieces that are cut.  **Performance Criteria:**  13.1: Examines the piece manually and visually for inconveniences such as burr and roughness.  13.2: Checks processed pieces according to given standards and production drawing using suitable measuring tools (steel rule, rule, caliper, goniometer, micrometer etc.).  13.3: Sorts waste and materials to be re-processed depending on defects.  13.4: Places pieces that are cut on the control/dispatch area adopting suitable methods.  13.5: Bales and/or pile fault-free pieces in line with instructions.  13.6: Knows control principles for the pieces that are cut.  13.7: Analyze the causes of after-cut faults.  **Learning Outcome 14**: Cleans the equipment and workspace after cutting process.  **Performance Criteria:**  14.1: Keeps the workspace clean and tidy to prevent any interruption that may occur in the work organization.  14.2: Cleans and return the equipment, measurement instruments and kits once the work is done.  14.3: Follows given instructions on using substances which are harmful to the environment and health, and store these substances accordingly.  14.4: Knows/applies cleaning methods for the machines and equipment that are in use.  **Learning Outcome 15**: Dispatches and reports.  **Performance Criteria:**  15.1: Dispatches materials to concerning unit for secondary process.  15.2: Tags materials that will not go through secondary process.  15.3: Identifies the procedure for materials which will and will not go through secondary process | |
| 8. | ASSESSMENT |
| 8 a) Theoretical Examination | |
| (T1) Multiple-choice exam is composed of at least 15 questions.  (T2) Theoretical examination is composed of minimum 3 open-ended questions along with at least 10 multiple-choice questions.  In order for candidates to succeed at T1 or T2 examinations, they need to score at least 60/100 points in total. Maximum 2 minutes are given per question. For each open-ended question, maximum 4 minutes are given.  One of T1 or T2 examination methods can be applied. | |
| 8 b) Performance Based Examination | |
| (P1) Performance based examination  The examination is performed under real production conditions bearing a production drawing which serves as the basis for plasma cutting in mind. Duration of the performance-based examination is calculated on cutting process duration performed under real working conditions.  During (P1) performance-based examination, the candidate shall follow each step successfully specified in the checklist. The checklist shall cover all learning outcomes. | |

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| 8 c) Other Conditions Related to Assessment | | |
| If a candidate fails in P1 examination, s/he is eligible to retake the exam in 6 months for those learning outcomes s/he previously failed at. | | |
| 9 | QUALIFICATION DEVELOPMENT INSTITUTION(S) | ANKARA CHAMBER OF INDUSTRY |
| 10 | SECTOR COMMITTEE TO VERIFY QUALIFICATION | VQA METAL SECTORAL COMMITTEE |
| 11 | APPROVAL DATE AND NUMBER OF VQA's BOARD OF DIRECTORS | 10/10/2012 - 2012/73 |

ANNEXES

ANNEX [B4]-1: Information on Recommended Training for the Qualification Unit

**Content of Training:**

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12UY0083-3/B5 OXI-GAS CUTTING QUALIFICATION UNIT

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| 1 | NAME OF THE QUALIFICATION UNIT | OXI-GAS CUTTING |
| 2 | REFERENCE CODE | 12UY00..-3/B5 |
| 3 | LEVEL | 3 |
| 4 | CREDIT VALUE | - |
|  | A) DATE OF PUBLICATION | 10/10/2012 |
| 5 | B) REVISION NO | 00 |
|  | C) REVISION DATE | - |
| 6 | OCCUPATIONAL STANDARD FORMING THE BASIS FOR THE QUALIFICATION UNIT | |
| MS0237-3 METAL CUTTER NATIONAL OCCUPATIONAL STANDARD | | |
| 7 | LEARNING OUTCOMES | |
| **Learning Outcome 1**: Surveys equipment operability.  **Performance Criteria**   1. Checks equipment safety systems periodically in line with instructions. 2. Checks equipment operability periodically against wear and breakdown in line with instructions. 3. Repairs or changes faulty/broken parts if the equipment is under one's responsibility or notifies authorized people if the procedure is beyond one's responsibility. 4. Knows equipment specifications. 5. Identifies basic terms related to oxi-gas cutting. | | |
| **Learning Outcome 2**: Records problems arising from breakdowns/wears and notify authorized persons.  **Performance Criteria**  2.1: Records inconveniences such as breakdowns/wears and notify authorized persons.  2.2: Notifies superiors about worn parts if the procedure is beyond one's responsibility.  2.3: Identifies equipment maintenance methods.  2.4: Knows the procedure to be followed for the equipment operating life of which is terminated. | | |
| **Learning Outcome 3**: Follows progressive maintenance procedures.  **Performance Criteria**  3.1: Stores maintenance supplies properly.  3.2: Maintains service-free equipment (nozzle etc.) under one's responsibility.  3.3: Analyzes causes of equipment breakdowns.  3.4: Identifies storage conditions for maintenance supplies.  3.5: Identifies service-free equipment maintenance principles. | | |
| **Learning Outcome 4**: Arranges the workspace.  **Performance Criteria**  4.1: Arranges the workspace depending on the working method.  4.2: Arranges to negative conditions in the workspace.  4.3: Controls and makes necessary arrangements for non-processable material along with wastage and junks.  4.4: Lays down working principles for the workspace depending on working method.  **Learning Outcome 5**: Prepares work schedule.  **Performance Criteria:**  5.1: Estimates approximate production time depending on process attributes and notify superiors if needed.  5.2: Prepares necessary form and documents before production and receive the approval of superiors if needed.  5.3: Identifies steps related to forms and documents to be prepared before production amongst options. | | |

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| **Learning Outcome 6**: Checks measuring instruments.  **Performance Criteria:**  6.1: Identifies measuring instruments depending on the work and material type.  6.2: Checks the accuracy of measuring instruments.  6.3: Notifies superiors about faulty instruments and know the calibration methods.  6.4: Knows and follow the procedure for keeping and protecting measuring instruments.  6.5: Knows measuring and control procedures. (tape measure, steel rule, gauge board, caliper, floating rule etc.)  **Learning Outcome 7**: Prepares necessary tools, kits, equipment and material.  **Performance Criteria:**  7.1: Appoints necessary tools, kits, equipment and material before work in line with instructions.  7.2: Brings determined tools, kits, equipment and material to the workspace.  7.3: Picks the suitable material for the cutting program.  7.4: Places and pile the chosen material on the cutting place.  7.5: Identifies specifications of materials to be cut.  **Learning Outcome 8**:Checks machines, equipment and benches before use.  **Performance Criteria:**  8.1: Checks gas pressure for oxi-gas cutting.  8.2: Checks and changes empty gas cylinders in line with OHS rules.  8.3: Knows flammable and combustible gases.  8.4: Recognizes flammable and combustible gas cylinders by their features.  8.5: Analyzes measures to be taken in case of blowback.  **Learning Outcome 9**: Chooses suitable nozzle for oxi-gas cutting machine.  **Performance Criteria:**  9.1: Applies the chosen parameter on the cutting program depending on the material type and thickness.   1. Places the suitable nozzle for the chosen parameter depending on the material type and thickness.   9.3: Adjusts the gas pressure depending on thickness of the material that will be cut.  9.4: Sets the distance between the piece and flame in accordance with the material thickness.  9.5: Knows parameter deviations (gas, pressure, flame etc.) in accordance with material type, thickness and cutting speed.  9.6: Identifies oxi-cutting machine nozzle types.  **Learning Outcome 10**: Places the piece to be cut on the bench.  **Performance Criteria:**  10.1: Inspects the chosen material in order to see if it is physically suitable for cutting. (manufacturing defects, surface roughness, waviness etc.)  10.2: Checks the dimensions of the material using suitable instruments (tape measure, steel rule, caliper, floating rule etc.) in accordance with the production drawing.  10.3: Places the chosen material on the cutting bench minding reference points.  10.4: Knows physical check and control principles for the material to be cut.  10.5: Knows how to place the material to be cut on the machine  10.6: Identifies the features of measuring instruments.  **Learning Outcome 11**: Marks materials.  **Performance Criteria:**  11.1: Prepares surfaces on which mark will be placed.  11.2: Marls pieces using suitable measuring and marking instruments (steel rule, ruler, caliper, scribber etc.) in accordance with the production drawing.  11.3: Checks marked piece measurement compliance to the production drawing using suitable measuring instrument.  11.4: Knows marking principles.  11.5: Knows marking instruments. |

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| Learning Outcome 12: Performs Oxi-gas cutting process.  Performance Criteria:  12.1: Checks material type and dimension compliance to the cutting program.  12.2: Adjusts reference place.  12.3: Inputs material dimensions into NC cutting machine.  12.4: Knows and make cutting gas pressure and flame adjustments.  12.5: Checks the distance between the material and nozzle, and perform the last checks.  12.6: Starts machine/torch cutting process.  12.7: Knows oxi-gas cutting machine features.  12.8: Knows oxi-gas cutting process operation sequence and features.  Learning Outcome 13: Cleans the pieces that are cut.  Performance Criteria:  13.1: Cleans the scrap off the pieces that are cut.  13.2: Cleans the slag off the material that is cut.  13.3: Places pieces that are cut on the control/dispatch area adopting suitable methods.  13.4: Is aware of the cleaning works.  Learning Outcome 14: Checks the pieces that are cut.  Performance Criteria:  14.1: Examines the piece manually and visually for inconveniences such as burr and roughness.  14.2: Checks processed pieces according to given standards and production drawing using suitable measuring instruments (steel rule, rule, caliper, floating rule etc.).  14.3: Sorts waste and materials to be re-processed depending on defects.  14.4: Bales and/or pile fault-free pieces in line with instructions.  14.5: Knows control principles for the pieces that are cut.  14.6: Analyzes the causes of after-cut faults.  Learning Outcome 15: Cleans the equipment and workspace after cutting process.  Performance Criteria:  15.1: Keeps the workspace clean and tidy to prevent any interruption that may occur in the work organization.  15.2: Cleans the machine and concerning equipment after work and return the equipment.  15.3: Follows given instructions on using substances which are harmful to the environment and health  and stores these substances accordingly.  15.4: Knows/applies cleaning methods for the machines and equipment that are in use.  Learning Outcome 16: Dispatches and reports.  Performance Criteria:  16.1: Dispatches materials to concerning unit for secondary process.  16.2: Marks pieces that will not be processed again.  16.3: Knows the procedure for the pieces which will or will not go through secondary process. | |
| 8 | ASSESSMENT |
| 8 a) Theoretical Examination | |
| (T1) Multiple-choice exam is composed of at least 15 questions.  (T2) Theoretical examination composed of minimum 3 open-ended questions along with at least 10 multiple-choice questions.  In order for candidates to succeed at T1 or T2 examinations, they need to get at least 60/100 points in total. Maximum 2 minutes are given per question. For each open-ended question, maximum 4 minutes are given.  One of T1 or T2 examination methods can be applied. | |
| 8 b) Performance Based Examination | |
| (P1) Performance based examination | |
| The examination is performed under real production conditions bearing a production drawing which serves as the basis for oxi-gas cutting in mind. Duration of the performance based examination is calculated on cutting process duration performed under real working conditions. | |

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| During (P1) performance test, the candidate shall follow each step successfully described in the checklist. The checklist shall cover each learning outcome. | | |
| 8 c) Other Conditions Related To Assessment | | |
| If a candidate fails in P1 examination, s/he is eligible to retake the exam in 6 months for those learning outcomes s/he previously failed at. | | |
| 9 | QUALIFICATION DEVELOPMENT INSTITUTION(S) | ANKARA CHAMBER OF INDUSTRY |
| 10 | SECTOR COMMITTEE TO VERIFY QUALIFICATION | VQA METAL SECTORAL COMMITTEE |
| 11 | APPROVAL DATE AND NUMBER OF VQA's BOARD OF DIRECTORS | 10/10/2012 - 2012/73 |

ANNEXES

ANNEX [B5]-1: Information on Recommended Training for the Qualification Unit

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12UY0083-3/B6 PROFILE CUTTING QUALIFICATION UNIT

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| 1 | NAME OF THE QUALIFICATION UNIT | PROFILE CUTTING |
| 2 | REFERENCE CODE | 12UY0083-3/B6 |
| 3 | LEVEL | 3 |
| 4 | CREDIT VALUE | - |
| 5 | A)DATE OF PUBLICATION | 10/10/2012 |
| B)REVISION NO | 00 |
| C) REVISION DATE | - |
| 6 | OCCUPATIONAL STANDARD FORMING THE BASIS FOR THE QUALIFICATION UNIT | |
| MS0237-3 METAL CUTTER NATIONAL OCCUPATIONAL STANDARD | | |
| 7 | LEARNING OUTCOMES | |
| Learning Outcome 1: Surveys machine equipment operability.  Performance Criteria:  1.1: Checks the equipment safety systems periodically in line with instructions.  1.2: Checks equipment operability periodically against wear and breakdown in line with instructions.  1.3: Notifies authorized people for the change or repair of faulty/broken parts on maintenance.  1.4: Knows equipment specifications.  1.5: Identifies basic terms related to profile cutting.  Learning Outcome 2: Follows progressive maintenance procedures.  Performance Criteria:  2.1: Stores maintenance supplies properly.  2.2: Maintains service-free equipment under one's responsibility.  2.3: Analyzes equipment breakdown causes.  2.4: Identifies storage conditions for maintenance supplies.  2.5: Identifies service-free equipment maintenance principles.  Learning Outcome 3: Arranges the workspace.  Performance Criteria:  3.1: Arranges the workspace depending on the working method.  3.2: Responds to negative conditions in the workspace.  3.3: Checks and makes necessary arrangements for non-processable materials or pieces.  3.4: Lays down working principles for the workspace depending on working method.  Learning Outcome 4: Prepares work schedule.  Performance Criteria:  4.1: Estimates approximate production time depending on process attributes and notify superiors if needed.  4.2: Prepares necessary form and documents before production and get the approval of the superiors if needed.  4.3: Identifies steps related to forms and documents to be prepared before production amongst options.  Learning Outcome 5: Checks measuring instruments.  Performance Criteria:  5.1: Identifies measuring instruments depending on the work and material type.  5.2: Checks the accuracy of measuring instruments.  5.3: Notifies superiors about faulty instruments and know the calibration methods.  5.4: Knows and follows the procedure for keeping and protecting measuring instruments.  5.5: Knows measuring and control procedures. (tape measure, steel rule, caliper, floating rule etc.) | | |

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| Learning Outcome 6: Prepares necessary tools, kits, equipment and material.  Performance Criteria:  6.1: Appoints necessary tools, kits, equipment and material before work in line with instructions.  6.2: Brings determined tools, kits, equipment and material to the workspace.  6.3: Determines measurement changes arising from calibration faults and fixes the equipment under one's responsibility.  6.4: Picks the suitable material for the cutting program.  6.5: Picks the suitable saw blade for the material.  6.6: Piles the chosen material on the cutting place.  6.7: Identifies suitable saw blade types for the material.  6.8: Identifies material specifications.  Learning Outcome 7: Prepares the saw.  Performance Criteria:  7.1: Adjusts the blade strain for band saw and check clamp operability  7.2: Checks the coolant pump and inform authorized persons in case of a defect.  7.3: Checks coolant level and add more liquid if needed.  7.4: Unclogs blocks on the coolant pipe, filter etc.  7.5: Checks pneumatic/hydraulic pieces of the band saw and notify the authorized persons in case of a defect.  7.6: Checks the compressor air pressure compliance to operating pressure for pneumatic machines.  7.7: Knows circular and band saw components along with their operating principles for a proper cutting process.  7.8: Knows pneumatic and hydraulic system components along with their operating principles (leak tightness, fluid, pressure check etc.).  Learning Outcome 8: Places the piece to be cut on the bench.  Performance Criteria:  8.1: Inspects the chosen material in order to see if it is physically suitable for cutting. (manufacturing defects, surface roughness, waviness etc.)  8.2: Checks the dimensions of the material using suitable instruments (tape measure, steel rule, caliper etc.) .  8.3: Makes necessary adjustments (gage, reference point settings) for the cutting in accordance with measurements.  8.4: Places the chosen material on the cutting bench minding reference points.  8.5: Fixes the material using clamps if needed.  8.6: Knows physical check and control principles for the material to be cut.  8.7: Knows/follows the procedure for placing materials on the machine.  8.8: Knows measuring instrument attributes.  **Learning Outcome 9:** Marks materials.  Performance Criteria:  9.1: Prepares surfaces on which mark will be placed.  9.2: Marks pieces using suitable measuring and marking instruments (steel rule, ruler, caliper, scribber etc.) in accordance with the production drawing.  9.3: Checks marked piece measurement compliance to the production drawing.  9.4: Knows marking methods.  Learning Outcome 10: Performs hydraulic/pneumatic band and circular saw, combined and sleeve shear cutting processes.  Performance Criteria:  10.1: Makes gage and angle adjustments in accordance with the production drawing and given measurements.  10.2: Places and processes the material.  10.3: Checks the measures and angles of the piece using suitable materials (tape measure, steel rule, caliper, floating rule etc.)  10.4: Makes adjustments in case of a deviation.  10.5: Monitors cutting processes for multiple-cuttings and check measurements periodically using suitable tools.  10.6: Knows hydraulic/pneumatic band and circular saw, combined and sleeve shear attributes.  10.7: Knows hydraulic/pneumatic band and circular saw, combined and sleeve shear cutting operation sequences |

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| and knows related operating conditions.  10.8: Identifies cutting faults and suitable measures that can be taken.  Learning Outcome 11: Checks the pieces that are cut.  Performance Criteria:  11.1: Cleans the scrap off the pieces that are cut.  11.2: Examines the piece manually and visually for inconveniences such as burr and roughness.  11.3: Checks processed pieces according to given standards and production drawing using suitable measuring instruments (steel rule, caliper, goniometer, micrometer etc.).  11.4: Sorts waste and materials to be re-processed depending on defects.  11.5: Places pieces that are cut on the control/dispatch area adopting suitable methods.  11.6: Bales and/or piles fault-free pieces.  11.7: Identifies procedures to be followed after the cutting process (to clean the scrap and waste, to detect fault levels, to pile/bale finished products etc.).  Learning Outcome 12: Recycles faulty parts.  Performance Criteria:  12.1: Identifies fixing procedure for faulty parts and notify concerning department.  12.2: Checks recycled pieces.  12.3: Piles finished products in line with instructions.  12.4: Identifies the process for faulty parts.  Learning Outcome 13: Cleans the equipment and workspace after cutting process.  Performance Criteria:  13.1: Keeps the workspace clean and tidy to prevent any interruption that may occur in the work organization.  13.2: Cleans and return the equipment, measurement instruments and kits once the work is done.  13.3: Follows given instructions on using substances which are harmful to the environment and health, and store these substances accordingly.  13.4: Knows/adopts cleaning methods for the machines and equipment that are in use.  Learning Outcome 14: Dispatches and reports.  Performance Criteria:  14.1: Dispatches materials to concerning unit for secondary process.  14.2: Marks pieces that will not be processed again.  14.3: Knows the procedure for the pieces that will or will not go through secondary process. | |
| 8 | ASSESSMENT |
| 8 a) Theoretical Examination | |
| (T1) Multiple-choice exam is composed of at least 15 questions.  (T2) Theoretical examination is composed of minimum 3 open-ended questions along with at least 10 multiple-choice questions.  In order for candidates to succeed at T1 or T2 examinations, they need to score at least 60/100 points in total. Maximum 2 minutes are given per question. For each open-ended question, maximum 4 minutes are given.  One of T1 or T2 examination methods can be applied. | |
| 8 b) Performance Based Examination | |
| (P1) Performance based examination  The examination is performed under real production conditions bearing a production drawing that serves as the basis for profile cutting in mind. Duration of the performance-based examination is calculated on cutting process duration performed under real working conditions. During (P1) performance test, the candidate shall follow each step successfully described in the checklist. The checklist shall cover each learning outcome. | |

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| 8 c) Other Conditions Related to Assessment | | |
| If a candidate fails in P1 examination, s/he is eligible to retake the exam in 6 months for those learning outcomes s/he previously failed at. | | |
| 9 | QUALIFICATION DEVELOPMENT INSTITUTION(S) | ANKARA CHAMBER OF INDUSTRY |
| 10 | SECTOR COMMITTEE TO VERIFY QUALIFICATION | VQA METAL SECTORAL COMMITTEE |
| 11 | APPROVAL DATE AND NUMBER OF VQA's BOARD OF DIRECTORS | 10/10/2012 - 2012/73 |

ANNEXES

ANNEX [B6]-1: Information on Recommended Training for the Qualification Unit

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**QUALIFICATION ANNEXES**

**ANNEX 1: Qualification Units**

12UY0083-3/A1 OCCUPATIONAL HEALTH AND SAFETY IN METAL CUTTING

12UY0083-3/A2 ENVIRONMENTAL PROTECTION LEGISLATION FOR METAL CUTTING

12UY0083-3/A3 QUALITY MANAGEMENT FOR METAL CUTTING

12UY0083-3/B1 SHEET CUTTING-SLICING

12UY0083-3/B2 UPCUT SHEAR CUTTING

12UY0083-3/B3 LASER CUTTING

12UY0083-3/B4 PLASMA CUTTING

12UY0083-3/B5 OXI-GAS CUTTING

12UY0083-3/B6 PROFILE CUTTING

**ANNEX2: TERMS, SYMBOLS AND ABBREVIATIONS**

**Environmental protection**: Practice of operating adapting eco-credential methods and materials or disposing harmful wastes properly.

**Slicing**: Cutting the sheet roll lengthwise in desired width and length.

**Straightening**: Straightening warped and bent sheet using suitable straightening tools. Electrode: The point where arcs occur during cutting process.

**Physical inspection**: Visual examination of a material.

**Recycling**: Process to change processed or unprocessed materials into new products along with similar processes.

**Pneumatic/hydraulic band saw**: A power tool which uses a blade consisting of a continuous blade to cut metal materials.

**ISCO**: The International Standard Classification of Occupations,

**OHS**: Occupational Health and Safety.

**Calibration**: Reporting based on comparison between measurements – one of known magnitude or correctness made or set with one reference device and another measurement made in as similar a way as possible with a second device.

**Quality Management System**: Collection of internationally accepted business processes focused on achieving quality.

**Cutting slag**: Molten by-product left over after desired metal has been processed.

**Burr**: Cutting leftovers and traces on the surface after metal cutting process.

**Personal protective equipment (PPE)**: Equipment designed to protect an employee from health and safety risks at work which can be worn, attached or held.

**Combined cutter:** Shear used for metal profile cutting.

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**Protective gear (shield)**: A piece protecting the nozzle and electrode during plasma cutting process.

**Laser cutting machine**: A machine using laser beams to cut metal materials.

**Lens**: An optical component of a laser cutting machine chosen in accordance with the material thickness and type.

**Marking**: Marking out cutting, piercing, connecting etc. point and lines shown on the production drawing on the material.

**Caliper**: A measuring and control device used to measure the material conformity based on calculations.

**Roll**: A cylindrical machine component used for straightening sheet metal.

**NC/CNC workbench**: A type of workbench controlling cutting program by PC or cards whose actions are controlled automatically according to logical ordering based on the embedded numbers, letters and symbols.

**Nozzle**: A device designed to control the gas direction in welding and cutting.

**Oxi-gas cutting bench**: equipment for oxi-gas cutting process.

**Plasma cutting machine**: A machine designed to cut metal materials using plasma technology.

**Risk**: Combination of the possibility of a dangerous situation to happen and its results.

**Feeler settings**: Setting the distance between cutting blades using feeler.

**Danger**: A source or an instance of risk, peril or injury at work arising from internal or external factors.

**Torch**: A device designed to control the protective gas and electrode direction in welding and cutting.

**Semi-finished good**: A product that has not been completely manufactured but semi-processed.

**ANNEX 3**: Horizontal and Vertical Progress Paths

**ANNEX 4**: Assessor Criteria Assessors are expected to:

1. Have 3-years' experience in metal technology and be engineers and technical teachers graduated from Engineering, Technique and Technology, Metalwork, Metallurgy and Machine operation departments and faculties, or
2. Have 5-years' experience and a vocational school associate degree in Metalwork, Metallurgy or Machine Operation.
3. Have master craftsman's diploma or Level 4 Metal Cutting Operator vocational qualification certificate and 5-years' experience in Metal Cutting.

At least two assessors are assigned for the examination. At least one of the assessors shall have one of specified (a or b) qualifications. As well as above-mentioned qualifications, assessors are expected to have been educated in assessment and Metal Cutting, and to be informed about national qualifications and standards.

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