

FABRICATE SHEET METAL PARTS

UNIT CODE: ENG/OS/MLF/CR/01/04/A

UNIT DESCRIPTION

This unit covers the competencies required by a Mechanical production (Lathe and Fabrication) artisan to fabricate sheet metal parts. It includes competencies that ensure the learner will: observe safety rules and regulations, identify sheet metal tools & Equipment, read and interpret working drawing, mark out, set up sheet metal fabrication machines and equipment, fabricate sheet metal components, assess quality of components, maintain sheet metal fabrication tools, machine and equipment and perform housekeeping

ELEMENTS AND PERFORMANCE CRITERIA

ELEMENT These describe the key outcomes which make up workplace function	PERFORMANCE CRITERIA These are assessable statements which specify the required level of performance for each of the elements. <i>Bold and italicized terms are elaborated in the Range</i>
1. Observe safety rules and regulations	1.1 Prescribed personal safety gear is worn as per work place procedure. 1.2 Prescribed safe work environment is observed as per rules and regulations. 1.3 Prescribed workplace procedures are adhered to.
2. Use sheet metal machines, tools & equipment.	2.1 Types of <i>sheet metal machine tools</i> /equipment identified as per the manufacturer's manual 2.2 Parts of sheet metal machine/equipment identified as per manufactures manual 2.3 Functions of the parts of a sheet metal machine identified as the manufacturers manual 2.4 Sheet metal machines, tools and equipment selected as per the operation plan 2.5 Sheet metal machine, tools and equipment used as per manufacturer's specification manual.
3. Plan work operation	3.1 Technical drawings and geometric symbols are read and interpreted as per <i>drawing standards</i> . 3.2 <i>Operation Plan</i> is prepared as per the working drawings. 3.3 Pattern development layout is sketched as per the work specification
4. Mark out work pieces	4.1 Marking and measuring tools selected as per specifications 4.2 Work piece dimensions are measured as per the specifications

	4.3 Dimensions are marked on work piece as per the <i>drawing specifications</i>
5. Set- up sheet metal machine and equipment	5.1 Machine, tools and equipment are selected as per operation plan 5.2 Attachments are mounted as per machine operational manual
6. Fabricate sheet metal component (s)	6.1 Accessories mounted as per machine manual 6.2 Sheet metal work pieces produced as per operation plan 6.3 Sheet metal parts joined as per the specifications
7. Assess Quality of the fabricated component(s)	7.1 Finished work is cleaned according to work place procedures 7.2 Finished work is inspected to specification 7.3 Finished work is tested for function ability as per the Specifications
8. Maintain sheet metal machines, tools and equipment	8.1 Machines, tools and equipment cleaned as per the work place procedures 8.2 Machines and tools are inspected as per the work place procedures 8.3 Faults on machines and tools are identified and reported as per the workplace procedures 8.4 Machines and equipment are lubricated as per the manufacturers manual
9. Perform housekeeping	9.1 Work environment cleaned in accordance with work place procedures 9.2 Waste is segregated and disposed as per the work place environmental procedures 9.3 Tools and equipment are stored as per the workplace Procedures

RANGE

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

Variable	Range
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1. Sheet metal machine tools include but not limited to:	1.1 Rolling Machine 1.2 Bending machine 1.3 Punching machine 1.4 Shearing machine
2. Drawing Standards includes but not limited to:	2.1 ISO 2.2 BS 2.3 ANSI
3. Operation Plan includes but not limited to:	3.1 Sequence of operations 3.2 Measuring tools 3.3 Hand tools 3.4 Cutting tools 3.5 Inspection tools
4. Drawing specifications includes but not limited to:	4.1 Dimensions 4.2 Tolerances 4.3 Geometry 4.4 Surface finishing 4.5 Functionality 4.6 Visual inspection

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit of competency.

Required Skills

The individual needs to demonstrate the following skills:

- Technical drawing
- Sheet metal development
- Soldering
- Welding
- Seaming
- Riveting
- Bolting
- brazing
- Use of the Guillotine, bending and rolling machines
- Use of hand tools to cut, fold and form sheet metal
- Production of holes in sheet metal
- Measuring and marking out

Required Knowledge

The individual needs to demonstrate knowledge of:

- Occupational Health and Safety Act of Kenya laws 2007 with focus on personal safety, machine safety and workplace
- National Environment Management Authority Act, Kenya 2004
- OSH act
- Equipment manuals
- Technical drawing complying to ISO, ANSI & BS standards
- ISO 1101 Geometrical tolerance and where to use the norm
- Measuring tools
- Hand tools
- Sheet metal development
- Joining methods (bolts, screws, rivets, seams, soldering, brazing and welding)
- Cutting, bending, and rolling machines
- Drilling, and punching machines, drills and punches
- WIBA act (2007)
- Report writing

EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

<p>1. Critical Aspects of Competency</p>	<p>Assessment requires evidence that the learner:</p> <ul style="list-style-type: none"> 1.1 Observed prescribed safety rules and procedures in sheet metal work as per the OSHA standards 1.2 Used sheet metal machine, tools and equipment as per manufacturers manual 1.3 Prepared operation Plan as per the working drawings 1.4 Sketched Pattern development layout as per the work specification 1.5 Marked dimensions on work piece as per the specifications 1.6 Selected machine, tools and equipment as per operation plan 1.7 Produced sheet metal work pieces as per operation plan 1.8 Joined sheet metal parts as per the specifications 1.9 Inspected finished work to specification 1.10 Cleaned machines, tools and equipment as per the work place procedures 1.11 Cleaned work environment in accordance with work place procedures
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2. Resource Implications	2.1 Cutting Machine 2.2 Rolling Machine 2.3 Bending machine 2.4 Punching machine 2.5 Drilling machine 2.6 Hand shearing machine 2.7 Hand tool and measuring instruments 2.8 Inspection tools 2.9 Gas welding set 2.10 Sheet metal materials 2.11 Resource materials, manuals for cutting tools and machine tools 2.12 Material safety data sheets 2.13 Occupational and safety act Kenya 2007
3. Methods of Assessment	Competency may be assessed through: 3.1. Observing the behavior of the learner 3.2. Inspecting of the written operation procedures 3.3. Inspecting the quality of the finished product with regards to drawing specification and tolerances. 3.4. Observing housekeeping by the learner 3.5. Observed the maintenance of tools and equipment
4. Context of Assessment	Competency may be assessed individually in the actual workplace or through accredited institutions
5. Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.