

JOB SPECIFICATION AND SKILL TEST

JOB TITLE : SHEET METAL WORKER, L – 2
SECTOR : MECHANICAL ENGINEERING
SUB-SECTOR : FABRICATING

COUNCIL FOR TECHNICAL EDUCATION AND VOCATIONAL TRAINING

NATIONAL SKILL TESTING BOARD

MADHYAPUR THIMI -17, SANOTHIMI, BHAKTAPUR, NEPAL

1994

The National Skill Standards and Test Was Developed by

~~JOB SPECIFICATION~~

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1	<p>JOB TITLE : SHEET METAL WORKERS</p> <p>LEVEL : 2</p>
2	<p>JOB DESCRIPTION</p> <p>A sheet metal worker of this level should be able to sketch & read simple drawing to work on metal sheets giving it various shapes e.g. simple square, rectangular, lidless boxes, and cylindrical items as per given specification. He/she should be able to selects proper sheets, and rivets as required. He/she should be proficient in using the simple measuring instrument and able to follows safety precaution. He/she precautions. He/she should be able to assists, and work under supervision of the supervisor.</p>
3	<p>LIST OF TASKS:</p> <ol style="list-style-type: none"> 1. Sketching and Reading simple Orthographic and Pictorial drawings. 2. Fabricating simple patterns (lidless square/ rectangular box). 3. Fabricating cylindrical items. 4. Riveting. 5. Performing fastening operations using nuts and bolts.
4	<p>QUALIFYING NOTES (entry requirement etc.):-</p> <p>PHYSICAL REQUIREMENTS: Normal Health.</p> <p>EDUCATIONAL REQUIREMENTS: Able to understand verbal instructions, read & write simple layout marks, and make simple calculation necessary in performing the job.</p>

TASK SPECIFICATION

5	TASK NO: 1 Sketching and Reading Simple orthographic and Pictorial drawings. JOB TITLE: SHEET METAL WORKER, L – 2
6	TASK ELEMENTS: <ol style="list-style-type: none">1. Receives verbal instructions, sketches/ simple drawings and read them.2. Selects and collects drawing instrument & papers.3. Measures & draws sketches/ simple drawing.4. Checks & measures the drawn sketch.5. Erases un-necessary marks/lines.

TASK SPECIFICATION

7	TASK PERFORMANCE REQUIREMENTS Pencil of three basic grades, Eraser, Quarter size/ A ⁴ size paper, Pencil cutter, drawing board, T- Square and drawing instruments.
8	TASK PERFORMANCE STANDARDS <ul style="list-style-type: none">• Drawing instrument selected as required.• The sketch / drawing interpreted correctly.• Completed the sketch/ drawing as required.

9	10	TASK TRAINING DATA			
TASK NO:	T. E. No.	TECHNICAL KNOWLEDGE	APPLIED CALCULATION	GRAPHIC INFORMATION	SAFETY & HYGENE
1	1 2	Identification the proper size of paper. Determination of the necessary drawing instruments for sketching or drawing.	Use of rules (imperial/metric). Simple addition, subtraction, multiplication and division.	Able to read simple sketch/ drawing.	Proper use and handling of drawing instruments.

TASK PERFORMANCE TEST (SKILL ASSESSMENT)			
11	TASK TITLE: SKETCHING AND READING SIMPLE ORTHOGRAPHIC/PICTORIAL DRAWINGS. TASK NO : 1		LOCATION OF TEST : CANDIDATE'S NAME : EVALUATORS NAMES:
12	TEST FACTORS AND ITEMS	STANDARD MET	STANDARD NOT MET (Comments)
	<u>DID THE CANDIDATE?</u> 1.1 Select proper paper size & drawing instrument as required. 1.2 Prepare the necessary sketch/simple drawing(s). 1.3 Interpreter sketch / drawing correctly.		

TASK SPECIFICATION	
5.	TASK NO: 2 Fabricating Simple Patterns (Lidless square, rectangular box.) JOB TITLE: SHEET METAL WORKER, L – 2
6.	TASK ELEMENTS: <ol style="list-style-type: none">1. Receives and follows verbal/written instructions.2. Wears protective safety clothing.3. Selects /Prepares appropriate hand tools/materials.4. Locates & marks the reference points as per sketch/drawing5. Lays out and cuts out the sheet.6. Bends/folds as per instruction.7. Forms joints using rivets.8. Checks the dimensions.

TASK SPECIFICATION	
7	<u>TASK PERFORMANCE REQUIREMENTS</u> Mild steel (Galvanometer/Black), Aluminium sheets, Marking scribe, Ruler, Sniper, Tri-square, bending bar, Clamp, Mallet, Steel hammer, Centre punch, Drill press/portable drill, Drill bits. File, Rivet set, and Wire brush.
8	<u>TASK PERFORMANCE STANDARDS</u> <ul style="list-style-type: none">• Selected proper materials and tools as required.• Marked including hem & seam parts on the sheet within the tolerance of $\pm 0.5\text{mm}$.• Cut, (including notches) using sniper with the tolerance of $\pm 0.5\text{mm}$.• Bended or folded to form the required shape with the tolerance of $\pm 2\text{mm}$.• Made holes for rivets as required.• Riveted properly (if required).

9	10	TASK TRAINING DATA			
TASK NO:	T. E. No.	TECHNICAL KNOWLEDGE	APPLIED CALCULATION	GRAPHIC INFORMATION	SAFETY & HYGENE
2	1 2 3 4	Identification of general ferrous and nonferrous sheets. Determination of proper thickness/ gauge of sheets. Identification of necessary tools. Ability to perform marking, cutting, bending punching, drilling, and riveting operations in proper sequence using right tools.	Use of measuring rules. Ability to perform simple calculations.	Able to read simple sketches/symbols for sheet metal works.	Use of protective clothing. Knowledge of safe handling of tools, equipment & materials

TASK PERFORMANCE TEST (SKILL ASSESSMENT)			
11	TASK TITLE: FABRICATING SIMPLE PATTERNS (LIDLESS SQUARE/RECTANGULAR BOX). TASK NO : 2		LOCATION OF TEST : CANDIDATE'S NAME : EVALUATORS NAMES:
12	TEST FACTORS AND ITEMS	STANDARD MET	STANDARD NOT MET (Comments)
	<u>DID THE CANDIDATE?</u> 1. Select correct materials as required. 2. Reject unsuitable material/sheets. 3. Select correct tools as required. 4. Mark, lay out, cut out within the specified tolerance. 5. Fold/bend as per specification. 6. Use the rivet set properly. 7. Check the size & shape against the specification. 8. Finish and clean the work piece.		

TASK SPECIFICATION

5	TASK NO: 3 FABRICATING CYLINDRICAL ITEMS JOB TITLE: SHEET METAL WORKER, L – 2
6	TASK ELEMENTS: <ol style="list-style-type: none">1. Receives and follows verbal/written instructions.2. Wears protective safety clothing.3. Selects /prepare necessary hand tool and materials.4. Locates & marks the reference points as per sketching/drawing.5. Lays out and cuts out the required sheets.6. Forms or rolls as per specification.7. Joins either using rivets or grooving.8. Checks the dimensions.

TASK SPECIFICATION

7	<u>TASK PERFORMANCE REQUIREMENTS</u> Mild sheet (Galvanized/ Black), Aluminium sheets, Marking scribe, Ruler, Sniper, Tri-square, Manual Rolling Machine, Stake, mallet, Wire brush, Steel hammer, Centre punch, Pin punch, Drill bit, Drill press/ Portable drill, Self grip pliers, Drift punch, File, and Rivet set.
8	<u>TASK PERFORMANCE STANDARDS</u> <ul style="list-style-type: none">• Selected proper tools as required.• Made necessary measurements and markings.• Cut out required length and notches within the tolerance of $\pm 0.5m$.• Rolled/formed cylindrical body.• Punched hole and riveted if required (within the tolerance of $\pm 2mm$).• Grooved if required (within the tolerance of $\pm 3mm$). <p>Note: The tolerance specified above are for the diameter range of 50 to 100 mm. and applicable for sheet gauges of 24 & 26.</p>

9	10	TASK TRAINING DATA			
TASK NO:	T. E. No.	TECHNICAL KNOWLEDGE	APPLIED CALCULATION	GRAPHIC INFORMATION	SAFETY & HYGENE
3	1 2 3 4	Identification of general Ferrous and Nonferrous sheets. Determination of proper thickness/gauge of sheets. Identification of necessary tools/equipment. Ability to perform marking, cutting, bending, punching, drilling, and riveting operations in proper sequence using right tools.	Use of measuring rules. Ability to perform simple arithmetic calculations.	Able to read simple sketches and symbols for sheet metal works	Use of protective clothing. Knowledge of safe handling of tools/equipment and materials.
TASK PERFORMANCE TEST (SKILL ASSESSMENT)					
11	TASK TITLE: FABRICATING CYLINDRICAL ITEMS. TASK NO : 3			LOCATION OF TEST : CANDIDATE'S NAME : EVALUATORS NAMES:	
12	TEST FACTORS AND ITEMS		STANDARD MET	STANDARD NOT MET (Comments)	
	<u>DID THE CANDIDATE?</u> 3.1 Select the correct materials as required. 3.2 Reject unstable materials/sheets. 3.3 Mark, lay out and cut out within the specified tolerance. 3.4 Roll either by using stake or manual rolling machine. 3.5 Check the size and shape against the specification. 3.6 Use proper rivets if required. 3.7 Groove properly if required. 3.8 Finish and clean the work piece.				

TASK SPECIFICATION	
5	<p>TASK NO: 4</p> <p>RIVETTING</p> <p style="text-align: right;">JOB TITLE: SHEET METAL WORKER, L – 2</p>
6.	<p>TASK ELEMENTS:</p> <ol style="list-style-type: none"> 1. Receives and follows verbal/written instructions. 2. Wears protective clothing. 3. Select appropriate rivets (Including Pop rivets). 4. Lays out and makes out the centre to make hole/holes. 5. Makes hole/holes using pin punch or drill bit. 6. Removes burrs. 7. Inserts rivets and completes the riveting operation with help of appropriate tools.

TASK SPECIFICATION	
7	<p><u>TASK PERFORMANCE REQUIREMENTS</u></p> <p>Appropriate sheets, Marking scribe, Ruler, Centre/pin punch, Drill press/portable drill, Drill bit, Riveting/Ball pain hammer, Drift punch, File, Mallet, rivets and rivet set, Wire brush, Tri-square, Pop riveting tools, Sniper, Self grip pliers.</p>
8	<p><u>TASK PERFORMANCE STANDARDS</u></p> <ul style="list-style-type: none"> • Selected proper materials, rivet and tools as required. • Made necessary measurements and markings. • Punched out/drilled the rivet holes within the tolerance of ± 0.5mm. • Removed the burrs. • Inserted appropriate rivets, and completed the riveting operation with the help of appropriate tools. • Checked and measured the completed work against the specification.

9	10	TASK TRAINING DATA			
TASK NO:	T. E. No.	TECHNICAL KNOWLEDGE	APPLIED CALCULATION	GRAPHIC INFORMATION	SAFETY & HYGENE
4	1	Identification of general Ferrous and Nonferrous sheets.	Use of measuring rules.	Able to read simple sketches and symbols for riveting.	Use of protective clothing
	2	Determination of proper thickness/gauge of sheets.			
	3	Identification of necessary tools/equipment.	Ability to perform simple arithmetic calculation.		Knowledge of safe handling of tools, materials and equipment.
	4	Ability to select proper size and type of rivet.			

TASK PERFORMANCE TEST (SKILL ASSESSMENT)			
11	TASK TITLE: RIVETTING		LOCATION OF TEST :
	TASK NO : 4		CANDIDATE'S NAME :
			EVALUATORS NAMES:
12	TEST FACTORS AND ITEMS	STANDARD MET	STANDARD NOT MET (Comments)
	<u>DID THE CANDIDATE?</u> 4.1 Select the proper size and types of rivets. 4.2 Reject the unsuitable materials and rivets. 4.3 Mark, lay out, punch and drill properly. 4.4 Set the proper overlaps of joints. 4.5 Handle the rivet set/tools properly. 4.6 Rivet properly. 4.7 Finish and clean the work piece.		

TASK SPECIFICATION	
5.	TASK NO: 5 PERFORMING FASTENING OPERATIONS USING NUTS AND BOLTS JOB TITLE: SHEET METAL WORKER, L – 2
6.	TASK ELEMENTS: <ol style="list-style-type: none"> 1. Receives and follows verbal/written instructions. 2. Wears protective clothing. 3. Selects proper size and types of fastening nuts and bolts. 4. Lays out and marks out the centre for making/drilling holes. 5. Makes /drills holes. 6. Removes burrs. 7. Inserts bolts and initially tightness nuts with hand. 8. Uses wrench or screwdriver to tighten further.

TASK SPECIFICATION	
7	<u>TASK PERFORMANCE REQUIREMENTS</u> Marking scribe, Centre Punch, Wrenches, Drill press/Portable drill, Drill bits, Hammer, Files, Drift punch, Vice grip pliers, sniper, Wire brush, Nuts, Bolts, and Screwdriver if applicable
8	<u>TASK PERFORMANCE STANDARDS</u> <ul style="list-style-type: none"> • Selected proper materials, nuts, bolts and tools as required. • Made necessary measurements and markings. • Marked, punched, and made/drill holes. • Removed burrs and cleaned. • Inserted bolts and initially tightened nuts by hand. • Used wrench (screwdriver if applicable) for further tightening. • Checked the fastening and cleaned the work piece.

9	10	TASK TRAINING DATA			
TASK NO:	T. E. No.	TECHNICAL KNOWLEDGE	APPLIED CALCULATION	GRAPHIC INFORMATION	SAFETY & HYGENE
5	1	Identification of general Ferrous and Nonferrous sheets.	Use of measuring rules.	Able to read simple sketches.	Use of protective clothing.
	2	Identification of different sizes of nuts and bolts.			Knowledge of safe handling of tools, materials and equipment.
	3	Identification of necessary tools.	Ability to perform simple arithmetic calculations.		

TASK PERFORMANCE TEST (SKILL ASSESSMENT)			
11	TASK TITLE: PERFORMING FASTENING OPERATIONS USING NUTS & BOLTS. TASK NO : 5		LOCATION OF TEST : CANDIDATE'S NAME : EVALUATORS NAMES:
12	TEST FACTORS AND ITEMS	STANDARD MET	STANDARD NOT MET (Comments)
	<u>DID THE CANDIDATE ?</u> 5.1 Select the proper material. 5.2 Select proper sizes of nuts and bolts. 5.3 Reject unsuitable materials, nuts and bolts. 5.4 Mark, lay out, punch, make hole/drill properly. 5.5 Tighten the nut and bolts in proper sequence. 5.6 Check the fastening and clean the work piece.		