

# Model Curriculum

## Mine Welder

**SECTOR: Mining**  
**SUB-SECTOR: Engineering Services**  
**OCCUPATION: Workshop -Mechanical**  
**REF ID: MIN/Q0423**  
**NSQF LEVEL: 4**



## Certificate

### CURRICULUM COMPLIANCE TO QUALIFICATION PACK – NATIONAL OCCUPATIONAL STANDARDS

is hereby issued by the

**SKILL COUNCIL FOR MINING SECTOR**

for the

### MODEL CURRICULUM

Complying to National Occupational Standards of  
Job Role/ Qualification Pack: 'Mine Welder' QP No. 'MIN/ Q 0423 NSQF Level 4'

Date of Issuance: December 24<sup>th</sup>, 2025

Valid up to: March 31<sup>st</sup>, 2027

\* Valid up to the next review date of the Qualification Pack



Authorized Signatory  
(Skill Council for Mining Sector)

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# Mine Welder

## CURRICULUM / SYLLABUS

This program is aimed at training candidates for the job of a “Mine Welder”, in the “Mining & Allied” Sector/Industry and aims at building the following key competencies amongst the learner

<b>Program Name</b>	<b>Mine Welder</b>		
<b>Qualification Pack Name &amp; Reference ID.</b>	MIN/Q0423		
<b>Version No.</b>	1.0	<b>Version update date</b>	
<b>Pre-requisites Training</b>	<b>to</b> Xth and statutory certificate		
<b>Training Outcomes</b>	<p><b>After completing this programme, participants will be able to:</b> A mine welder is responsible for joining various types of metallic frames, structures, jigs, plates, sheets etc. using heating and melting process created through electrical power and gaseous discharge, maintaining process parameters, conducting quality checks on output product and maintaining a safe &amp; healthy working.</p> <p><b>Become well versed with Environment Health &amp; Safety:</b> Well versed with on-site health and safety measures relating to blasting and use of personal protective equipment.</p> <p><b>Identify and use basic tools, equipment &amp; materials:</b> Understanding of carrying out welding of equipment's.</p>		

This course encompasses 5 out of 5 National Occupational Standards (NOS) of “Mine Welder” Qualification Pack issued by “Skill Council for Mining Sector”.

Sr. No.	Module	Key Learning Outcomes	Equipment Required
1	<p><b>Introduction</b></p> <p><b>Theory Duration</b> (hh:mm) 10:00</p> <p><b>Practical Duration</b> (hh:mm) 20:00</p> <p><b>Corresponding NOS Code</b> Bridge Module</p>	<p>Understanding of following</p> <p>A Welder conducts end to end operations regarding welding of various elements and equipment in the mine. The individual will be responsible for joining various types of metallic frames, structures, jigs, plates, sheets etc. using heating and melting process created through electrical power and gaseous discharge, maintaining process parameters, conducting quality checks on output product and maintaining a safe &amp; healthy working environment.</p> <p>An individual to have technical knowledge of welding and metallurgy, ability to plan and prioritize, quality consciousness, sensitivity to problem solving:</p> <ul style="list-style-type: none"> <li>• Understand processes and equipment requirement to complete the task.</li> <li>• Prepare the machine, auxiliaries and work pieces for the welding process.</li> <li>• Conduct the Welding process and weld the work pieces.</li> <li>• Ensure completion of post operations activities like inspection, storage and maintenance.</li> </ul>	
2	<p><b>Understand processes and equipment requirement to complete the task.</b></p> <p><b>Theory Duration</b> (hh:mm) 20:00</p> <p><b>Practical Duration</b> (hh:mm) 45:00</p> <p><b>Corresponding NOS Code</b> MIN/N 0464</p>	<p>This OS unit is about understanding the job requirement, what processes need to be executed, what equipment will be used for the project and what is the required output considering the standard specified.</p> <ul style="list-style-type: none"> <li>• Understand the welding requirements, equipment and parameters.</li> <li>• Understand the right welding methodology and process to be adopted for completing the work order through discussions with the supervisor and reading the process manuals/ Work Instructions/Standard Operating Procedures.</li> <li>• Understand the various welding parameters like temperature, pressure, electrode type, electrode distance, process cycle time etc. before starting the welding process, as mentioned in the Work Instructions/ SOP manual.</li> <li>• Understand the material required and the equipment availability for executing the activity.</li> <li>• Understand the type of electrodes – material wise &amp; dimension wise, type of filler material etc. used for the welding process.</li> </ul>	<p>Welding rod, power supply, welding metal, eye protector glass with cover, Bunning elements Sample Helmet, gloves, harness, earplugs, goggles, node mask.</p>
3	<p><b>Prepare the welding machine, auxiliary apparatus and metal work pieces for the welding process.</b></p>	<p>Preparing the surface of the metal parts by removing dust, moistures, rough edges etc., cleaning the welding apparatus and the electrodes and installing the metal parts (Jigs) and electrodes on the welding machine/ assembly block. This unit/task covers the following:</p> <ul style="list-style-type: none"> <li>• Arrange for the material and equipment for welding.</li> </ul>	<p>Welding rod, power supply, welding metal, eye protector glass with cover, Bunning elements</p>

	<p><b>Theory Duration</b> (hh:mm) 20:00</p> <p><b>Practical Duration</b> (hh:mm) 70:00</p> <p><b>Corresponding NOS Code</b> MIN/N 0465</p>	<ul style="list-style-type: none"> <li>• Prepare the surface to be welded.</li> <li>• Understand the material required and the equipment availability for work.</li> <li>• executing the activity</li> <li>• Ensure that the required material is procured from the store before starting.</li> <li>• The welding process ensures that the surface of the electrodes is cleaned and the welding gun to remove dust and any other impurities.</li> <li>• Ensure that the other welding machine auxiliaries (Welding Transformer, Gas Discharge unit, Flux wire) are cleaned before the initiation of the welding process, as mentioned in the Work Instructions/ Standard Operating Procedures(SOP).</li> <li>• Setup the welding apparatus as per the selected welding process and the Internal SOPs/ Work Instructions and the setting standard for the machine Ensure that the surface to the metal parts (work pieces) which need to be joint are cleaned.</li> <li>• Prepare the edge for the strongest possible weld using techniques like machining, chipping, grinding, oxy- acetylene cutting and carbon arc cutting.</li> <li>• Ensure that the parameters for edge parameters are as per the desired.</li> </ul>	<p>Sample Helmet, gloves, harness, earplugs, goggles, node mask.</p>
4	<p><b>Conduct the Welding Activities</b></p> <p><b>Theory Duration</b> (hh:mm) 25:00</p> <p><b>Practical Duration</b> (hh:mm) 60:00</p> <p><b>Corresponding NOS Code</b> MIN/N 0466</p>	<p>This QP is about conducting welding Operation as per the methodology selected for welding and the Standard Operating Procedures defined by the Organization and the outcome of the work order. This unit/task covers the following:</p> <ul style="list-style-type: none"> <li>• Installation of the work pieces and conduct of the welding process.</li> <li>• Receive work permit from the supervisor.</li> <li>• Hold the parts (Jigs) which need to be welded together using a</li> <li>• clamp and align them with the electrodes as per the job.</li> <li>• requirement so that the work pieces do not fall down/ turn</li> <li>• Install the work pieces on the Welding apparatus keeping in mind.</li> <li>• the electrodes distance, contact area, pressure, temperature</li> <li>• application filling etc. as specified in the Welding SOP/ Control plan.</li> <li>• Documents/Work Instructions and instructed by the operator/</li> <li>• welder and the supervisor.</li> <li>• Check for operation of core welding equipment like welding gun, welding transformer, gas cylinders and gas discharge guns.</li> <li>• case of MIG/ MAG welding) as per setup documentation.</li> <li>• Identify shift direction hazard.</li> <li>• Conduct destructive and non- destructive test activity to ensure</li> </ul>	<p>Welding rod, power supply, welding metal, eye protector glass with cover, Bunning elements Sample Helmet, gloves, harness, earplugs, goggles, node mask.</p>

		<ul style="list-style-type: none"> <li>• conformance to the SOPs/ Work Instructions.</li> <li>• Inform supervisor to make modifications in the welding parameters as per the test activity outcomes and the prescribed standard for Destructive/ Non Destructive Tests.</li> <li>• Check for the positioning of the spot and the welding gun as per the work instructions and the work order/ hold the filler metal/ Flux material wire and the Welding Gun at the recommended angle and distance mentioned in the setup document, keeping the work pieces' stationary to ensure the required melting of base metal; Ensure the flow of filler material/ gas discharge as per the welding standard prescribed in the SOP/ Work Instructions.</li> <li>• Monitor the welding process (Pressure, Temperature, gas discharge flow, electrode force, electrode distance etc.) by observing the readings on the panels/ measuring instruments to prevent any harm to the work pieces due to overheating, burning, over melting, change in applied pressure etc.</li> <li>• Note down the observations in the prescribed format Observe and analyze any irregularity in the welding process and take preventive steps so that the overall quality of weld is as per the desired standard.</li> </ul>	
5	<p><b>Ensure completion of post operations activities like inspection, storage and maintenance</b></p> <p><b>Theory Duration</b> (hh:mm) 10:00</p> <p><b>Practical Duration</b> (hh:mm) 30:00</p> <p><b>Corresponding NOS Code</b> MIN/N 0467</p>	<p>Inspecting the finished goods produced for any damages, deformities and further repairing the parts produced so that the damaged/ defective pieces can be corrected. This unit/task covers the following:</p> <ul style="list-style-type: none"> <li>• Inspection of finished goods and maintaining records.</li> <li>• Ensure 100 % inspection of output products by comparing the dimensions of the output pieces with the specifications of the finished product using devices like micrometers, vernier calipers, gauges, rulers, weighing scales and any other inspection equipment.</li> <li>• Compare texture, color, surface properties, hardness and strength with the given specifications described the in work order/ Work Instructions.</li> <li>• Separate the defective pieces into two categories – pieces which can be repaired/ modified and pieces which are beyond repair by putting tags/ markings on the welded jig/ work piece surface Ensure that the pieces which are not OK and not meeting the specified standard and cannot be repaired are discarded.</li> <li>• Ensure that the output pieces are correctly clamped and lifted using suitable equipment like hoist, lifts, crane, etc.</li> <li>• Ensure that there is no damage to the lifted work pieces.</li> <li>• Carry the output product to the designated area using hangars, conveyor belts, cranes, forklifts etc.</li> <li>• Techniques of using measurement instruments like rulers, vernier calipers, micrometers, weighing scale,</li> </ul>	<p>Welding rod, power supply, welding metal, eye protector glass with cover, Bunning elements Sample Helmet, gloves, harness, earplugs, goggles, node mask.</p>

		<p>gauges and other inspection equipment.</p> <ul style="list-style-type: none"> <li>Guidelines to identify quality defects in work pieces – visual/ test based.</li> <li>Methods used for cutting, shearing, hammering, drilling which can repair pieces with minor defects.</li> <li>Basic level maintenance and cleaning techniques.</li> <li>Various solvents, chemicals, lubricants etc. used during the maintenance processes.</li> <li>Procedure for arranging the equipment in the prescribed manner including tagging and numbering of machine parts.</li> <li>Safety precautions to be taken during cleaning and maintenance activities.</li> <li>Basic welding defects and corrective measures</li> </ul> <p>Basic level operations of lifting equipment like hoists, cranes, pulley etc.</p>	
6	<p><b>Health &amp; Safety</b></p> <p><b>Theory Duration</b> (hh:mm) 10:00</p> <p><b>Practical Duration</b> (hh:mm) 12:00</p> <p><b>Corresponding NOS Code</b> MIN/N 0901</p>	<p>This unit is about health and safety measures critical in open-cast mines.</p> <ul style="list-style-type: none"> <li>Health and safety measures critical for personnel working in open-cast mines.</li> <li>Comply with occupational health and safety regulations adopted by the employer.</li> <li>Follow mining operations procedures with respect to materials handling and accidents.</li> <li>Adhere to the safety guidelines specified by Directorate General of Mine Safety (DGMS)).</li> </ul>	<p>Gloves, Safety shoes, Safety goggles, Safety helmet, Fire extinguisher, Types of log book, First Aid box</p>
	<p><b>Total Duration</b></p> <p><b>Theory Duration</b> 100:00</p> <p><b>Practical Duration</b> 250:00</p>	<p><b>Unique Equipment Required:</b> Welding rod, power supply, welding metal, eye protector glass with cover, Bunning elements Sample Helmet, gloves, harness, earplugs, goggles, node mask.</p>	

Grand Total Course Duration: 350 Hours, 0 Minutes

(This syllabus/ curriculum has been approved by SSC: Skill Council for Mining Sector)



## Trainer Prerequisites for Job role: "Mine Welder" mapped to Qualification Pack: "MIN/Q0423"

Sr. No.	Area	Details
1	<b>Description</b>	To deliver accredited training service, mapping to the curriculum detailed above, in accordance with the Qualification Pack "MIN/Q0423".
2	<b>Personal Attributes</b>	Aptitude for conducting training, and pre/ post work to ensure competent, employable candidates at the end of the training. Strong communication skills, interpersonal skills, ability to work as part of a team; a passion for quality and for developing others; well-organised and focused, eager to learn and keep oneself updated with the latest in the mentioned field.
3	<b>Minimum Educational Qualifications</b>	Preferably ITI – Mechanical/ Welding Technology passed and statutory certificate.
4a	<b>Domain Certification</b>	Statutory Certificate from Directorate General of Mines Safety (DGMS) for Job Role: "Mine Welder" mapped to QP: "MIN/Q0423". Minimum accepted score for domain certification will be 85%.
4b	<b>Platform Certification</b>	Recommended that the Trainer is certified for the Job Role: "Trainer", mapped to the Qualification Pack: "MIN/Q0423". Minimum accepted score for platform certification will be 90%.
5	<b>Experience</b>	2-3 years of experience of maintenance work like electrical / mechanical maintenance.

## Annexure: Assessment Criteria

<b>Assessment Criteria for Mine Electrician</b>	
<b>Job Role</b>	<b>Mine Welder</b>
<b>Qualification Pack</b>	<b>MIN/Q0423</b>
<b>Sector Skill Council</b>	<b>Mining</b>

<b>Sr. No.</b>	<b>Guidelines for Assessment</b>
1	Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Performance Criteria (PC) will be assigned marks proportional to its importance in NOS. SSC will also lay down proportion of marks for Theory and Skills Practical for each PC.
2	The assessment of the theory/knowledge will be based on written test/viva-voce or both while skill test shall be hands on practical. Behavior and attitude will be assessed while performing the task.
3	Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training Centre (as per assessment criteria given)
4	Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/training Centre based on these criteria.
5	To pass the Qualification Pack, every trainee should score a minimum of 70% in skills, 30 % in knowledge and 70% in practical including Behavior separately in each attributes.
6	In case of successfully passing only certain number of NOS's, the trainee is eligible to take subsequent assessment on the balance NOS's to pass the Qualification Pack.

Assessable Outcome	Assessment Criteria	Marks Allocation			
		Total Mark (100)	Out Of	Theory	Skills Practical
1. MIN/ N 0446 (Understand job requirements and related processes)	PC1. Understand the work (work output) required from the job and discuss the same with the supervisor.	<b>25</b>	4	1	3
	PC2. Understand the electrical layout.		5	1	4
	PC3. Refer all work instruction/ related documents to understand requirements from electrical substations/ electrical equipment/ electrical wiring or fixtures.		4	1	3
	PC4. Understand the specifications for various systems within electrical substations/ transmission of electricity/ use/ operation of electrical equipment/ electrical wiring or fixtures as mentioned in the Work Instruction/ SOP/ Control Diagrams.		5	1	4
	PC5. Prepare sketches or follow blueprints to determine the location of wiring or equipment and to ensure conformance to safety codes.		4	2	2
	PC6. Identify the electrical equipment requirements as per the specifications in the work instructions for installation of electrical substations/ electrical equipment/ electrical wiring or fixtures.		3	1	2
			<b>25</b>	<b>2</b>	<b>18</b>
2. MIN/ N0465 (Prepare the machine, auxiliaries and work pieces for the welding process)	PC1. Understand the material required and the equipment availability for executing the activity.	<b>20</b>	2	0	2
	PC2. Ensure that the required material is procured from the store before starting the welding process.		2	0	2
	PC3. Ensure that the surface of the electrodes is cleaned and the welding gun to remove dust and any other impurities.		3	1	2
	PC4. Ensure that the other welding machine auxiliaries (Welding Transformer, Gas Discharge unit, Flux wire) are cleaned		3	1	2

	before the initiation of the welding process, as mentioned in the Work Instructions/ Standard Operating Procedures(SOP).				
	PC5. Setup the welding apparatus as per the selected welding process and the internal SOPs/ Work Instructions and the setting standard for the machine.		3	1	2
	PC6. Ensure that the surface to the metal parts (work pieces) which need to be joint are cleaned.		3	1	2
	PC7. Prepare the edge for the strongest possible weld using techniques like machining, chipping, grinding, oxy-acetylene cutting and carbon arc cutting.		2	0	2
	PC8. Ensure that the parameters for edge parameters are as per the desired specifications like speed, cost, adaptability etc.		2	0	2
			<b>20</b>	<b>4</b>	<b>16</b>
3. MIN/ N0466 (Conduct the Welding process and weld the work pieces)	PC1. Receive work permit from the supervisor.	<b>20</b>	1	0	1
	PC2. Hold the parts (Jigs) which need to be welded together using a clamp and align them with the electrodes as per the job requirement so that the work pieces do not fall down/ turn.		2	1	1
	PC3. Install the work pieces on the Welding apparatus keeping in mind the electrodes distance, contact area, pressure, temperature application etc. as specified in the Welding SOP/ Control plan Documents/Work Instructions and instructed by the operator/ welder and the supervisor.		2	1	1
	PC4. Check for operation of core welding equipment like welding gun, welding transformer, gas cylinders and gas discharge guns ( in case of MIG/ MAG welding) as per setup documentation Identify shift direction hazard.		1	0	1
	PC5. Conduct destructive and non-destructive test activity to ensure conformance to the SOPs/ Work Instructions		1	0	1
	PC6. Inform supervisor to make modifications in the welding parameters as per the test activity outcomes and the prescribed standard for Destructive/ Non		1	0	1

	Destructive Tests.				
	PC7. Adjust the current/ voltage, temperature application as per the welding requirement and the activity test conducted earlier so that the desired heat can be created for the welding process.		2	1	1
	PC8. Check for the positioning of the spot and the welding gun as per the work instructions and the work order/ hold the filler metal/ Flux material wire and the Welding Gun at the recommended angle and distance mentioned in the setup document, keeping the work pieces stationary to ensure the required melting of base metal; Ensure the flow of filler material/ gas discharge as per the welding standard prescribed in the SOP/ Work Instructions.		2	1	1
	PC9. Monitor the welding process ( Pressure, Temperature, gas discharge flow, electrode force, electrode distance etc.) by observing the readings on the panels/ measuring instruments to prevent any harm to the work pieces due to overheating, burning, over melting, change in applied pressure etc.		2	1	1
	PC10. Note down the observations in the prescribed format .		1	0	1
	PC11. Observe and analyze any irregularity in the welding process and take preventive steps so that the overall quality of weld is as per the desired standard		1	0	1
	PC12. Measure the final welded piece and compare the dimensions as prescribed in the work order engineering drawing.		2	1	1
	PC13. In case the parts are not as per the given measurements, ensure that the assistant operators/ helpers remove extra material by using chippers, grinders etc.		1	0	1
	PC14. In case of any dents or bulges, ensure hammering of the bulges to give the work pieces the desired shape.		1	0	1
		<b>Total</b>	<b>20</b>	<b>6</b>	<b>14</b>
4. MIN/ N0467 (Ensure completion of post operations activities like inspection,	PC1. Ensure 100 % inspection of output products by comparing the dimensions of the output pieces with the specifications of the finished product using devices like micro meters, vernier calipers, gauges, rulers, weighing scales and any other inspection equipment.	<b>20</b>	1	0	1

storage and maintenance)					
	PC2. Compare texture, color, surface properties, hardness and strength with the given specifications described the in work order/ Work Instructions.		1	0	1
	PC3. Separate the defective pieces into two categories – pieces which can be repaired/ modified and pieces which are beyond repair by putting tags/ markings on the welded jig/ work piece surface.		2	1	1
	PC4. Ensure that the pieces which are not OK and not meeting the specified standard and cannot be repaired are discarded.		2	1	1
	PC5. Maintain data records for quality defects and pieces which are beyond repair.		1	0	1
	PC6. Ensure that the output pieces is correctly clamped and lifted using suitable equipment like hoist, lifts, crane, etc.		2	1	1
	PC7. Ensure that there is no damage to the lifted work pieces		2	1	1
	PC8. Carry the output product to the designated area using hangars, conveyor belts, cranes, forklifts etc.		2	1	1
	PC9. Ensure that all equipment is stored in a proper order as indicated in the equipment manual and the designated area .		2	1	1
	PC10. Ensure that the equipment and the work place are regularly cleaned and that there is not accumulation of dust, moisture and waste material .		1	0	1
	PC11. Check the working of all bearing, rollers, shafts etc. and oil all moving parts of the equipment on a periodic basis.		2	1	1
	PC12. Check the working of non-moving parts and periodically conduct preventive maintenance to prevent machine failure.		1	0	1
	PC13. Periodically check the equipment calibration and report any errors to the maintenance teams for rectification.		1	0	1
			<b>20</b>	<b>7</b>	<b>13</b>
	<b>QP Total</b>		<b>100</b>	<b>26</b>	<b>74</b>
	<b>Percentage Weightage:</b>			<b>26%</b>	<b>74%</b>
	<b>Minimum Pass% to qualify (aggregate):</b>			<b>70%</b>	