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| Title | **Perform submerged arc welding (SAW) operations** |
| Level | **2** | **Credits** | **10** |

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| Purpose | This Competency Standard identifies the competencies required to perform Submerged Arc Welding (SAW) operations at workplace by welder in accordance with the organization’s approved guidelines and procedures. You will be expected to organize the workplace for welding, prepare the base metal for welding, perform operations related to Submerged Arc Welding (SAW) and perform post welding operations at the workplace. Your underpinning knowledge regarding Submerged Arc Welding (SAW) operations will be sufficient to provide you the basis for your work. |

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| Classification ISCED | 0715 Mechanics and metal trades |

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| Available grade | Competent / Not yet competent |

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| Modification history | N/A |

| **Unit of Competency** | **Performance Criteria** | **Knowledge** | **Tools & Equipment** |
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| F1. Organize the workplace | **Trainee will be able to:** P1. Arrange the workplace according to the requirement of the job * Welding machine and accessories
* Electric supply
* Jigs and fixtures
* Lighting

P2. apply the safety measures as per work permit * Ventilation
* Fire extinguishers
* First Aid box
* Emergency alarm/light
* Ambulance
* Personal protective equipment

P3. Prepare the required welding machine as per job requirement * Type of current (AC/DC)
* Current polarity
* Travel speed
 | **Trainee will be able to:**K1. Describe the requirements of a workplace for welding the specific job K2. Describe the organizational safety rules and guidelines K3. Describe the preparation of welding machine including * Type of current (AC/DC)
* Current polarity
* Travel speed
 | Welding machine with accessories, flux drying oven,grinder, chipping hammer, wire brush, jigs and fixtures, lights, exhaust fans, fire extinguishers, first aid box, PPE  |
| F2. Prepare the base metal for welding  | **Trainee will be able to:**P1. Arrange tools and cleaning chemicals required for the job P2. Prepare joint as per drawing * Joint preparation
* Joint cleaning

P3. Follow the welding procedure specification (WPS) / instruction sheet for welding P3. Apply specific safety precautions associated with welding job  | **Trainee will be able to:** K1. Describe the usage of tools required for the jobK2. Describe the importance of joint preparation, cleaning and tackingK3. Define welding procedure specification (WPS) / instruction sheetK4. Apply specific safety precautions associated with welding job | Grinders, cutters, beveling machine, file, measuring tools, WPS/ instruction sheet, PPE  |
| F3. Perform operations related to Submerged Arc Welding (SAW) Operations | **Trainee will be able to:** P1. Arrange the wire spool and flux as per welding procedure specification (WPS) / instruction sheetP2. Arrange pre-heating equipment as per welding procedure specification (WPS) / instruction sheetP3. Adjust welding parameters as per welding procedure specification (WPS) / instruction sheet* Voltage
* Amperes
* Travel speed
* Type of Polarity
* Stickout

P4. Perform welding as per welding procedure specification (WPS) / instruction sheet* Pre heat the job, if required
* Perform welding operation
* Inter-pass cleaning
* Inter-pass inspection
* Maintain inter-pass temperature

P5. Apply specific safety precautions associated with welding job/process  | **Trainee will be able to:** K1. Determine the specifications/ classification of wire-flux combination required for the job K2. Read and interpret instructions of WPS/ instruction sheetK3. State the importance of pre heating K4. Describe how to adjust welding parameters and their effects on weldK5. Demonstrate welding operation as per WPS/instruction sheet K6. Apply specific safety precautions associated with welding job/process | Welding equipment with accessories, wire spool, flux, pre-heating equipment, grinders, wire brush, wire cutter, chipping hammer, temple sticks, flux drying oven, PPE, WPS/ instruction sheet |
| F4. Perform post welding operations | **Trainee will be able to:** P1. Apply post weld cleaning of the job following the process * Removal of unused flux
* Removal of slag
* Removal of jigs and fixtures

P2. Perform visual inspection of weld area P3. Perform post-heating of the job as per WPS/ instruction sheet, if required P4. Apply specific safety precautions associated with welding job/process | **Trainee will be able to:** K1. State the importance of post weld cleaning of the job K2. Identify visually, imperfections of weld K3. Describe the purpose of post-heating K4. Apply specific safety precautions associated with welding job/process  |  post-heating equipment, grinders, wire brush, chipping hammer, PPE, WPS/ instruction sheet |