



## WORLD CONSTRUCTION CHAMPIONSHIP

### Qualification criteria for applicants in the individual nomination "Manual Electric Welder"

#### APPLICANTS

Currently employed specialists; students; and independent applicants.

#### COUNTRIES

Russia,  
India,  
Kazakhstan,  
Kyrgyzstan,  
Pakistan,  
Uzbekistan,  
Tajikistan,  
Belarus,  
Armenia,  
Azerbaijan,  
Moldova,  
Turkmenistan,  
Turkey,  
Egypt,  
Bangladesh,  
Hungary.

#### GENERAL DESCRIPTION

The welder performs quality control of assemblies to be welded and quality welding of steel structures and pipework using various types of welding in different spatial positions and in strict compliance with detailed design and manufacturing documents.

#### QUALIFICATION CRITERIA REQUIREMENTS

Manual arc welding of complex assemblies, structures, and pipes made of various steels. Manual arc welding of complex building structures and systems operating under difficult conditions. Welding of complex modular structures, with welds in any spatial position. Fusion welding of various parts of machines, mechanisms, and structures. Fusion welding of complex parts and assemblies.

#### REQUIREMENTS FOR EDUCATION AND AVAILABILITY OF SPECIAL PERMITS

##### For currently employed specialists:

A manual welder with at least Grade 4 qualification, certified in two types of welding: manual argon arc welding and manual arc welding with a coated electrode.

Or: An electric and gas welder with at least Grade 4 qualification, certified in two types of welding: manual argon arc welding and manual arc welding with a coated electrode.

Or: A welder of Grade 3-4 qualification, certified in two types of welding: manual arc welding with a coated consumable electrode and gas-shielded manual arc welding with a non-consumable electrode. Both types of welding to be performed with respect to complex and critical structures.

Documents:

- document confirming the qualification grade;
- proof of health and safety training, which is in force in the participant's country (copy).

**For students:**

People of 18 or over who are students of a higher education institution in a technical area.

Documents:

- document confirming the qualification grade/or a document confirming the right to carry out this type of work.
- copy of the document certifying that the person is studying at a higher education institution;
- proof of occupational health and safety training, which is in force in the participant's country (copy).

### **SKILLS REQUIREMENTS**

- read drawings and flow charts;
- select the spatial position of the weld for welding structural elements (products, sub-assemblies, components);
- use assembly jigs to assemble structural elements (products, sub-assemblies, components) for welding;
- use manual and mechanised tools to prepare structural elements (products, sub-assemblies, components) for welding, deburring of welds, and removal of surface defects after welding;
- use measuring tools to check the assembled elements (products, sub-assemblies, components) for compliance with the geometric dimensions in accordance with the design and manufacturing documentation;
- use design, manufacturing, and regulatory documentation to carry out preparatory and assembly operations prior to welding and to clean welds after welding;
- check that the welding equipment is working and in good order;
- set up the welding equipment for welding;
- set up the gas apparatus for quality shielding of welded joints;
- master the technique of manual argon arc welding of non-swiveling pipe joints with welds in any spatial position;
- master the technique of manual arc welding with a coated electrode on non-swiveled pipe joints with welds in any spatial position;
- check the geometry of the weld with a measuring tool against the requirements of the design and manufacturing documentation for welding;
- correct surface defects; and
- check the quality of the welding consumables.

### **KNOWLEDGE REQUIREMENTS**

- the design of the applicable welding equipment;
- the design of the applicable gas appliances;
- the physical and chemical properties of the shielding gases;
- the specifics of argon arc welding of steels;
- argon arc welding technology;
- the technology of manual arc welding with a coated electrode;
- the basics of electrical engineering within the scope of the work to be performed;
- international regulatory documents;
- methods of inspection and testing of welds;
- types of defects in welded seams, their causes, methods of prevention and elimination;

- the principle of selecting a welding regime by instrumentation; and
- grades and types of welding (filler) wire and electrodes; rules of quality control and preparation for welding.

#### **JOB RESPONSIBILITY REQUIREMENTS**

- organising one's workplace in accordance with the assignment and health and safety requirements for this assignment;
- carrying out preparatory and assembly operations prior to welding and clean welds after welding;
- performing manual arc welding (surfacing, cutting) with a coated consumable electrode on complex and critical structures (equipment, products, sub-assemblies, pipelines, components) made of various steels and designed for work under pressure, static, dynamic, and vibration loads;
- performing manual arc welding (surfacing) with a non-consumable electrode under shielding gas on complex and critical structures (equipment, products, sub-assemblies, pipelines, components) made of various steels and designed for work under pressure, static, dynamic, and vibration loads; and
- use measuring tools to check structures before and after welding to ensure that their geometric dimensions conform to the requirements of the design and manufacturing documentation for welding.