

Technical Description

Welding

Skill 40



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1 Skill Overview

1.1 Skill Name and Category

Welding, Industry

1.2 Number of Competitors

This is an individual Skill Competition with one competitor.

1.3 Competition Time

The total competition time is 5 hours and is divided into the following modules:

- Module A: Carbon Steel Welding Specimens – 2 hours 30 minutes
- Module B: Aluminium Alloy Structure and Stainless Steel Fillet Weld – 2 hours 30 minutes

1.4 Description of the Skill

Welding is a critical process controlled by national and international standards and specifications to ensure the quality of welded joints and the competence of the welder.

Competitors are expected to prepare, assemble and join different metals and metal alloys using appropriate welding processes. They must be able to interpret engineering drawings, standards and welding symbols and apply these requirements accurately in their work.

Competitors use welding, grinding and cutting equipment to prepare and complete welded joints. They must select the appropriate equipment, process variables and welding techniques according to the material and task requirements.

The skill requires knowledge of welding processes and equipment, materials, safe working practices, personal protective equipment, and the effects of welding on the materials being joined.

2 Task Assignment Overview

2.1 Task Assignment Description and Familiarisation Session

The Task Assignment is the main competition task used to assess the competitors' skills. It defines what the competitors must complete during the competition and forms the basis for all assessments. The final result is evaluated only on the finished work produced during the official competition time.

A familiarisation session is organised on C-1. During this session, competitors may enter the workshop, see the workspace, check the available tools and materials, and ask questions about procedures or practical arrangements. Competitors are not allowed to practise, start, or rehearse any part of the Task Assignment during this session.

2.2 Task Assignment Structure

The competition consists of two modules:

Module A: Carbon Steel Welding Specimens

Competition time: 2 hours 30 minutes

Module A consists of two carbon steel welding tasks:

Task 1: Fillet Weld

Competitors assemble and weld a carbon steel fillet weld specimen according to the provided drawing and requirements. The welding process and welding position are determined as specified in the Task Assignment.

Task 2: Butt Weld

Competitors assemble and weld a carbon steel butt weld specimen according to the provided drawing and requirements. Competitors use the alternative welding process to the one used for Task 1. The welding position is determined as specified in the Task Assignment.

The welding processes used in Module A are 111 MMA and 135 MAG.

Module B: Aluminium Alloy Structure and Stainless Steel Fillet Weld

Competition time: 2 hours 30 minutes

Module B consists of two welding tasks:

Task 1: Aluminium Alloy Structure

Competitors assemble and weld an aluminium alloy structure using the 141 TIG welding process, according to the provided drawing and requirements.

Task 2: Stainless Steel Fillet Weld

Competitors assemble and weld a stainless steel fillet weld specimen using the 141 TIG welding process, according to the provided drawing and requirements. The welding position is determined as specified in the Task Assignment.

2.3 Task Assignment Technical Requirements

Competitors are required to demonstrate the following skills and knowledge:

- interpreting welding drawings, dimensions, symbols, and specifications;
- preparing and assembling welding specimens and structures;
- using 111 MMA, 135 MAG, and 141 TIG welding processes;
- welding in the required welding positions;
- setting up and adjusting welding equipment;
- producing fillet and butt welds according to specified requirements;
- welding carbon steel, stainless steel, and aluminium alloy;
- controlling distortion during assembly and welding;
- applying appropriate tack-welding techniques;
- using appropriate weld cleaning and finishing methods;
- checking completed work against drawings and specifications;
- assessing and verifying weld quality; and
- following welding health and safety requirements.

The Task Assignment defines the exact requirements, including drawings, dimensions, materials, welding processes and positions, weld specifications, assembly and tack-welding requirements, inspection and hold points, permitted cleaning and finishing methods, and may include task-specific variations or additional elements.

3 Materials and Equipment

3.1 Materials and Equipment Provided by the Competition Organiser

The Organiser provides the materials, tools, and equipment listed below.

Images are for reference only. They do not indicate a specific brand or model unless otherwise stated in the specifications. Quantities are per competitor unless otherwise stated.

Items will be available at the competitor's workstation or in the designated competition area, as appropriate. Where exact brands, models, or task-specific material details are not specified, these may be confirmed before the competition or defined in the Task Assignment, as appropriate.

No.	Equipment / Material	Picture	Specifications	Quantity
01	TIG AC/DC / MMA welding machine		Kemppi Master T 245 ACDC	1
02	MAG / MMA welding machine		Kemppi X3 FastMig Pulse	1
03	MAG welding torch			1
04	TIG welding torch			1

No.	Equipment / Material	Picture	Specifications	Quantity
				
05	MMA welding torch			1
06	Tungsten sharpener			1 per skill area
07	Argon gas		Bottle	1
08	Argon gas CO ² (18% CO ²)		Bottle	1
09	Basic double-coated		Ø 2.5 / 3.2 mm	1 pack/ per size

No.	Equipment / Material	Picture	Specifications	Quantity
	welding electrodes			
10	Manual press brake		Similar	1 per skill area
11	TIG aluminium rod			1 pack
12	TIG steel rod			1 pack
13	TIG welding torch consumables			1 set
14	MAG welding torch consumables			1 set

No.	Equipment / Material	Picture	Specifications	Quantity
				
15	Abrasive discs		Cut-off disc 1.6 mm, disc 3.2 mm, grinding disc	1 set

3.2 Materials and Equipment Supplied by Competitors

Competitors may bring only the materials, tools, and equipment listed below. Personal tools and equipment must fit within a toolbox or tool case suitable for checked luggage, with a maximum total weight of 23 kg, including the toolbox or case. This requirement does not apply to clothing, footwear, personal protective equipment (PPE), or equipment required due to the competitor's condition or special needs and agreed in advance with the Organiser.

Images are for reference only. They do not indicate a specific brand or model unless the specifications state otherwise. Quantities are per competitor unless otherwise stated.

No.	Equipment / Material	Picture	Specifications	Quantity
01	Safety shoes		Protective toe caps; complying with EN ISO 20345:2022	1 pair
02	Workwear		Fire-resistant protective clothing complying with EN ISO 11611; including long trousers	1 set

No.	Equipment / Material	Picture	Specifications	Quantity
03	Welding helmet		Suitable for the welding processes used in the competition	1
04	Welder's gloves		Suitable for MMA, MAG, and TIG welding	As required
05	Safety glasses		With side protection	1
06	Hearing protection		Suitable for the work performed	1 set
07	Flat files			1 set
08	Hammer			1
09	Set square			1
10	Ruler			1

No.	Equipment / Material	Picture	Specifications	Quantity
				
11	Angle grinder		Complete with 125 mm discs	1
12	Clamps			1 set
13	Measuring tape			1
14	Wire brush			1
15	Chisels			1 set

No.	Equipment / Material	Picture	Specifications	Quantity
16	Weld gauge (fillet gauge)			1
17	Pliers			1

3.3 Prohibited Materials and Equipment

Competitors may use only the materials, tools, and equipment listed in Sections 3.1 and 3.2, unless otherwise authorised by the Skill Manager or Chief Judge. This restriction does not apply to clothing, footwear, or personal protective equipment (PPE) required in Section 4.1, or to equipment required due to the competitor's condition or special needs and agreed in advance with the Organiser.

All other materials, tools, and equipment are not permitted.

4 Skill-Specific Requirements

4.1 Skill-Specific Requirements

The Skill-Specific Requirements below apply to this Skill Competition and must be followed in addition to the Abilympics Competition Rules. The Skill Manager or Chief Judge may provide additional instructions, as needed, to ensure the competition is conducted safely and fairly.

Topic	Skill-Specific Requirements
Materials and tools provided by the Organiser	Competitors must check all materials, tools, and equipment before the competition begins. If any item is missing, damaged, or defective, competitors must immediately inform the Judges. No replacements will be provided after competition time has commenced, unless authorised by the Judges. If equipment or tools provided by the Organiser fail and the failure is confirmed not to have been caused by the competitor, the Chief Judge may grant additional time. No additional time will be provided for the failure of equipment or tools brought by the competitor. Wire nesting is not considered an equipment failure.
Use of personal tools	Competitors may bring and use only the personal tools and equipment listed in Section 3.2. No other personal tools or equipment are permitted. This restriction does not apply to equipment required due to the competitor's condition or special needs and agreed in advance with the Organiser.
Personal protective equipment (PPE)	Competitors must use the following personal protective equipment: • safety glasses with side protection; • hearing protection; • welding helmet; • welding gloves; • safety shoes with protective toe caps complying with EN ISO 20345:2022; • fire-resistant protective clothing complying with EN ISO 11611.
Clothing / Uniform	There is no mandatory uniform. Competitors must wear the protective clothing specified under PPE, including long trousers.
Sideline coaching	Competitors must remain at their workstations or within the designated competition area during competition time, unless authorised to leave by the Judges. Competitors may not communicate

Topic	Skill-Specific Requirements
	with other competitors or members of the public during competition time. Competitors may communicate with Judges, Interpreters, personal assistants, and other authorised persons when required. The role and permitted involvement of a personal assistant must be agreed in advance with the Organiser based on the competitor's condition or special needs.
Use of technology	Competitors may not use personal laptops, tablets, mobile phones, smartwatches, or other personal communication or electronic devices during competition time. Competitors must store such devices away and may access them only during the lunch break or at the end of the competition day. This restriction does not apply to devices required due to the competitor's condition or special needs and agreed in advance with the Organiser. Judges and Interpreters may use devices required for their official duties only as agreed by the Skill Manager and the Chief Judge. The Skill Manager and the Chief Judge may use devices required for competition management and will specify any additional restrictions or permitted device use within the competition area.

5 Assessment Framework

5.1 Assessment Principles

All Abilympics Skill Competitions are marked out of 100 points.

Points are divided between criteria that reflect the required skills and expected outcomes.

Two methods of assessment are used:

- **Measurement:** objective, factual scoring (e.g., size, accuracy).
- **Judgement:** expert evaluation of quality, technique, and artistic choices.

5.2 Assessment Areas

Detailed marking criteria and scoring are provided in the Task Assignment.

Assessment focuses on the following key areas:

Assessment Area	Points
Module A: Two Carbon Steel Welding Specimens	50
Module B: Aluminium Alloy Structure and Stainless Steel Fillet Weld	50
Total	100