

WorldSkills UK Refrigeration, Air Conditioning and Heat Pumps



Competition Handbook 2026

“Quality In Everything That We Do”

The aim of this manual is to provide advice and guidance to all stakeholders in the preparation for all stages of the refrigeration, air conditioning and heat pump WorldSkills UK National Competition.

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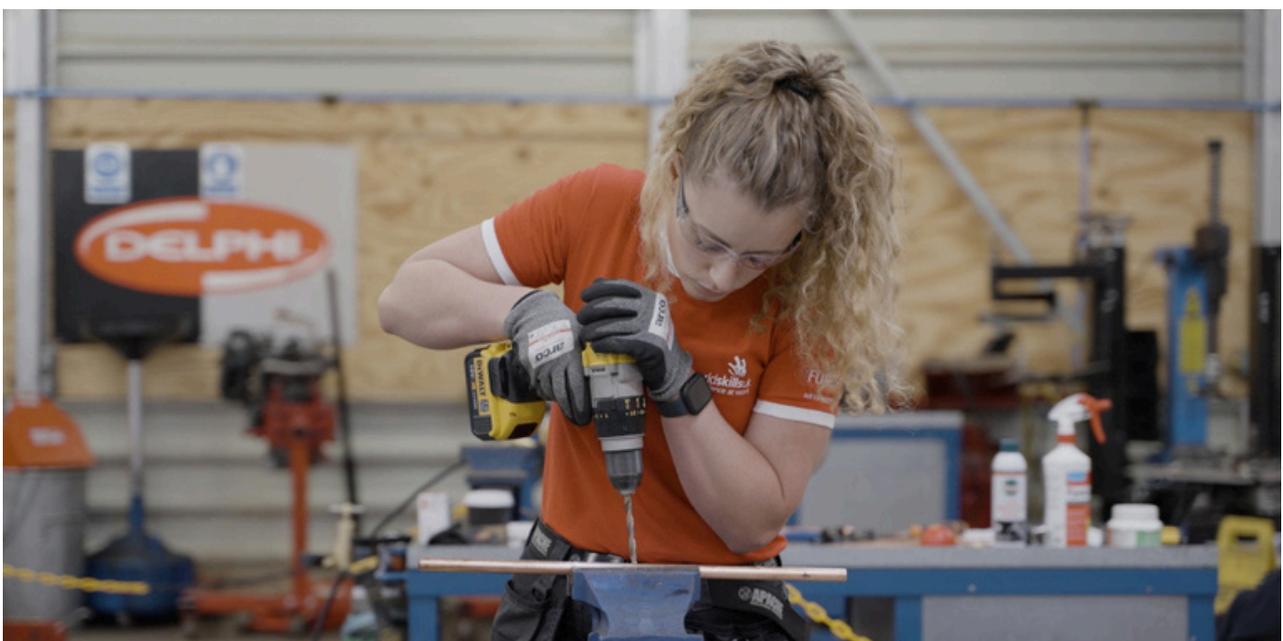
ABOUT THE RACHP SECTOR

The Refrigeration, Air Conditioning and Heat Pump (RACHP) sector underpins many essential parts of modern society. From keeping food safe, supporting healthcare and scientific environments, and maintaining comfortable buildings, to enabling low-carbon heating through heat pump technology, the sector plays a crucial role in both commercial and domestic settings.

The industry is shaped by rapid developments in environmental legislation, refrigerant technology, system efficiency requirements, and the UK's drive toward decarbonisation. As a result, organisations across construction, facilities management, transportation, retail, logistics, food production and digital infrastructure depend on reliable, energy-efficient cooling and heating systems.

Because demand continues to grow and diversify, the RACHP sector requires technicians and businesses capable of adapting to new technologies, meeting high quality standards, and working safely with systems that can have significant environmental impact.

This manual provides a clear route from the early stages of competition selection through to the WorldSkills UK National Finals and potential opportunities beyond, supporting apprentices and competitors as they develop their skills within this evolving industry.



WHAT YOU'LL DO IN THIS OCCUPATION

The RACHP Engineering Technician is a specialised engineering role responsible for planning, preparing, and safely carrying out work on systems that provide process cooling, product cooling, environmental control, and low-carbon heating.

Precision, accuracy, problem-solving, and attention to detail are essential at all stages of the job, whether installing new equipment or diagnosing faults on complex systems.

RACHP technicians work in a wide range of environments vital to the UK economy, including:

- food production, retail and distribution
- transport refrigeration
- commercial and residential climate control
- manufacturing and industrial process cooling
- petrochemical and pharmaceutical environments
- IT/data centres and critical infrastructure
- healthcare, laboratory and medical applications

Key responsibilities include designing, installing, commissioning, maintaining, servicing and de-commissioning RACHP systems. To carry out this work effectively, technicians require strong practical skills supported by a sound understanding of engineering principles, especially thermodynamics and the vapour compression cycle.

A fully competent technician can work independently, make informed decisions on-site, and communicate effectively with customers, system owners and other trades.

The occupation is continually evolving due to changes in refrigerants, energy-efficiency requirements, environmental legislation and safety standards. Because RACHP systems account for a significant share of national energy use and greenhouse gas emissions, technicians play an important role in reducing environmental impact and ensuring the safety of colleagues, end users and the wider public.

QUALIFICATIONS & CAREER PATHWAYS

This section outlines the recognised qualification pathways available to new entrants joining the Refrigeration, Air Conditioning and Heat Pump (RACHP) industry across the United Kingdom. Each nation has its own apprenticeship structure and qualification requirements. The information below reflects the approved and active routes for 2026.

England

England delivers training for new RACHP technicians through a national apprenticeship standard designed to develop technical competence, safety, system knowledge and professional behaviours.

Approved Apprenticeship Route

- Level 3 RACHP Engineering Technician Apprenticeship (ST0322, Version 1.3)

Qualification Requirements

Apprentices complete the City & Guilds 6090 qualification suite, which includes:

- Level 2 Diploma in RACHP Systems (6090-20)
- Level 3 Diploma in RACHP Systems (6090-30)
- On-programme components (6090-21 / 6090-31)
- End-point assessment elements (6090-50 / 6090-51)

Delivery and Assessment

Training is delivered through approved providers and employers, combining workplace learning with structured technical instruction. Assessment includes knowledge tests, practical evaluations and a final independent end-point assessment.

Wales

Wales operates its own apprenticeship framework system, ensuring apprentices develop the skills, knowledge and behaviours required by Welsh industry. Frameworks must meet the requirements of the Specification of Apprenticeship Standards in Wales (SASW).

Approved Apprenticeship Route

- Level 3 Refrigeration and Air Conditioning Apprenticeship (Framework ID: FR05057)

Qualification Requirements

The framework includes:

- An occupational competence qualification
- A technical knowledge qualification
- Essential Skills Wales (e.g., communication, application of number and digital literacy)

Delivery and Assessment

Training is delivered through recognised Welsh centres. Assessment typically includes workplace evidence, portfolio development, knowledge assessments and demonstration of competency against National Occupational Standards.

Northern Ireland

Northern Ireland delivers sector training through the apprenticeshipsNI programme. The HVACR framework provides new entrants with the skills required to work across refrigeration, air conditioning and heat pump applications.

Approved Apprenticeship Route

- Level 3 Heating, Ventilation, Air Conditioning and Refrigeration (HVACR) Apprenticeship Framework

Qualification Requirements

Apprentices complete both knowledge and competence qualifications. For air conditioning and heat pump pathways, this includes:

- City & Guilds Level 3 NVQ Certificate in Servicing and Maintaining Air Conditioning and Heat Pump Systems (600/0909/3)

Delivery and Assessment

Delivery combines employer-based training with college attendance. Providers such as the South Eastern Regional College (SERC) deliver RACHP apprenticeship programmes aligned to industry needs. Assessment includes practical skills assessment, portfolio evidence and knowledge testing

Scotland

Scotland delivers RACHP training through competency-based Scottish Vocational Qualifications (SVQs), aligned with National Occupational Standards and the Scottish Credit and Qualifications Framework (SCQF).

Approved Apprenticeship Route

- SCQF Level 6 SVQs in Refrigeration and Air Conditioning

Qualification Requirements

Approved pathways include:

- SVQ Install, Commission and Maintain Air Conditioning Systems (SCQF Level 6)
- SVQ Install, Commission and Maintain Refrigeration Systems (SCQF Level 6)

Delivery and Assessment

Training is delivered through workplace learning supported by approved centres. Assessment is competence-based and includes observation, portfolio evidence and verification against National Occupational Standards.



COMPETITION ENTRY CRITERIA

Eligibility for competitors to enter the competition is as follows:

- Competitors must be at least 16 years old.
- Must be employed and either working toward or have completed a recognised RACHP qualification, within the last 12 months.
- Must hold (or be due to hold before June 23rd) F-Gas Category 1 certification.
- Must have no more than 3 years industry experience, excluding apprenticeship duration.
- Competition format: Individual competition (not team-based).
- Number of entrants: No organisational cap, but we prioritise quality over quantity.

COMPETITION STAGES

1. REGISTRATIONS OPEN

The competition officially opens for registrations on Monday 2 March via the WorldSkills UK Website and close on Friday 27 March.

Competitors are encouraged to complete the pre-entry test.

3. REGIONAL QUALIFIERS

Top competitors will be invited to compete in the regional qualifiers taking place at the InstallerSHOW, NEC Birmingham between 23–26 June 2026

2. ONLINE 1-HOUR ENTRY TEST

Registered competitors will take an online 1-hour entry test between Monday 2 March to Friday 17th April, these can be booked any working day between 9–5 that suits the competitor.

4. TRAINING AND UPSKILLING

Competitors are invited to training ahead of the finals. This will take place in October at the BESA Annual Conference. Finalists are also invited to the BESA Industry Awards where their achievement will be recognised on stage.

5. NATIONAL FINALS

Six competitors will then be invited to compete at the National Finals in Cardiff between Tuesday 17th November to Friday 20th November, when the competition ends with a medal ceremony

PRE-ENTRY TEST (FABRICATION 1)

Before entering the competition, we ask colleges, training providers, and employers to run a pre-entry skills test. This helps identify candidates who have the right skills, attitude and readiness to progress through the competition.

You'll receive a pipework fabrication drawing, marking schedule, and materials list. Candidates must complete the fabrication within a set time, giving everyone a fair and consistent assessment.

This test acts as a benchmarking tool to help judge technical ability, accuracy and competition readiness. The WorldSkills UK Learning Lab can also be used alongside the test to support skills development and provide additional benchmarking opportunities.

Entry Recommendation

Candidates who score 60% or above in the pre-entry test are encouraged to register for the WorldSkills UK competition.

Administration & Marking

The pre-entry test is administered and self-marked by the college, training provider or employer. Marking schedules for candidates put forward for registration must be kept for six months, as WorldSkills UK or the Competition Organising Partner (BESA) may request them at any stage.

Agreement to Progress

Once a candidate is selected for registration, both the candidate and employer must confirm they agree to support participation at every stage of the competition. This commitment is confirmed by accepting the WorldSkills UK Terms and Conditions.

Download the test

You can download the test simply by filling out the online form here:

[Download the pre entry test](#)

HOW TO IDENTIFY THE RIGHT CANDIDATES

In order to assist in selecting competitors for the WorldSkills UK competition, a list of attributes and requirements has been compiled to support the identification of an ideal entrant. Although it is understood that a candidate may not possess every single attribute listed, the goal is for the candidate to exhibit as many of these qualities as possible.

This list is not exhaustive, it serves as a guideline to ensure that individuals who have the greatest potential to excel and represent the RACHP sector in the competition.

- Able to operate specialist tools such as vacuum pump, recovery unit, nitrogen equipment for pressure testing
- Able to operate flame brazing equipment such as oxygen and propane/acetylene, MAPP gas
- Demonstrates accuracy when taking and applying measurements
- Understands RAC theory of basic system operation
- Motivated in the further education environment
- Motivated in the working environment
- Demonstrates adaptation to changing environments
- Maintains a calm demeanour when working under pressure and solving problems
- Anticipates before acting
- Motivated to complete work within time schedules
- Produces quality work to standards
- Demonstrates good communication skills
- Demonstrates good interpersonal skills
- Demonstrates a high level of capability and flexibility
- Demonstrates confidence
- Demonstrates a professional attitude
- Demonstrates responsibility for own work
- Commitment to continued professional development
- Respectful of others
- Encouraging and supportive employer

HOW TO REGISTER FOR THE COMPETITION

Once the identity of the candidate's appropriate skillset has been confirmed, those wishing to participate can register for the WorldSkills UK competition. The registration process open on Monday 2 March and close on Friday 27 March 2026.

Registration details and information can be found at:
www.worldskillsuk.org

All online registrations require to be submitted prior to the advertised closing date.

All candidates registered will receive a notification by email that they require to complete registration by agreeing to the WorldSkills UK terms and conditions.

This agreement to the terms and conditions is mandatory and forms part of the General Data Protection Regulations and Data Protection rules.

If the candidate does not agree then their registration is not complete, and their details cannot be shared with the Competition Organising Partner and as a result this will end their participation in the competition.



PRE-QUALIFIER SELECTION PROCESS

During the months of March and April, all successful competitor registrants will be invited to undertake an entry test. This test will be in the form of an invigilated online multiple-choice question paper designed to demonstrate the candidate's knowledge.

The highest scoring candidates will qualify to attend the WorldSkills UK Qualifier Heats.

TRAINING AND DEVELOPMENT (FABRICATION 2)

It is recommended that the competitors that qualify to attend the WorldSkills UK Qualifier Heats undertake a staged process of training to include:

- Fabrication of pipework
- Pressure testing
- Evacuation
- Charging and recovery of refrigerants

A fabrication training test, complete with tools and material list and a marking schedule has been designed for colleges, training providers and employers to help prepare candidates for the qualifier heat. The fabrication training test includes a fabrication task to assess the candidate's ability to create offset bends and evaluate their knowledge of pressure testing. The completed fabrication can also be used to demonstrate evacuation.

Colleges, training providers and employers can request the documentation for the fabrication training test from the Competition Organising Partner.

WORLDSKILLS UK NATIONAL QUALIFIER HEATS

The WorldSkills UK National Qualifier Heats will be held at a suitable identified venue. This year they will be hosted at the NEC, in Birmingham.

The purpose of the WorldSkills UK National Qualifier Heats is to evaluate the proficiency and expertise of the candidates, up to six of the highest scoring candidates, who have achieved the 50% and above benchmark, will be invited to compete at the WorldSkills UK National Final. Two reserve competitors will also be selected.

In the event of tied scoring at the completion of the qualifier heats, then the results from the pre-qualifier selection test can be utilised to assist in decision making.

The typical set up of a National Qualifier Heat will be:

Time	Activity
08:00	Arrival
08:15 – 08:30	Induction and competition introduction
08:30 – 09:00	Familiarisation with tools, material and equipment
09:00 – 11:30	Competition task A or B – 2.5 hours
11:30 – 12:30	Lunch
12:30 – 13:00	Familiarisation with tools, material and equipment
13:00 – 15:30	Competition task A or B – 2.5 hours
15:30 – 16:30	Feedback to candidates
16:30 – 17:00	Depart

All candidate output from the tasks will be assessed by the judges against a marking schedule, a typical overview of a marking schedule for a National Qualifier Heat will be:

Weight	Aspect	Criteria	Max marks
1	C	Electrical Wiring & Control Fault Finding	12
2	D	Pressure Testing & Evacuation (refrigeration)	14
3	E	Charging Refrigerant (emission control)	16
4	F	Refrigeration System Commissioning (efficient setup)	20
5	B	Refrigerant Recovery (emission control)	16
6	A	Pipework Fabrication	22
Total Marks			100

The marking schedule may be revised for an annual cycle of the competition but will be consistently applied across all National Qualifier Heat within a cycle.

Safety is paramount during the competition. Therefore, if a judge determines that a competitor has breached or is about to breach a safety critical factor then that judge has the authority to stop that particular task immediately. The competitor will not be able earn any further marks for that task.

CORE SKILLS AND COMPETENCES

The WorldSkills National Qualifier Heat(s) is designed to allow the competitor to demonstrate the following skills and knowledge:

- Work safely
- Follow detailed work plans and instructions
- Perform calculations
- Measure, cut and fabricate with materials used in RACHP industry
- Assemble pipe work and components to prescribed instructions
- Join materials using non-permanent mechanical fixing methods (flare)
- Join materials using permanent non mechanical methods (brazing, solder)
- Pressure test pipe work and components to BSEN 378 standard
- Evacuation to industry standards
- Test control wiring and basic components for electrical faults
- Interpret simple ladder/connection wiring diagrams for RACHP systems
- Correct use of tools, materials and components used in the RACHP industry
- Completion of commissioning sheets and F-Gas records (communication)
- Refrigerant Recovery, Charging, Leak testing and record completion (F-Gas cat 1)
- Analyse information to overcome challenges (problem solve)
- Analyse system operation and use test instruments to fault find



WHAT TO EXPECT IN COMPETITION TASKS

Pipework Fabrication

Candidates must work safely and follow a systematic approach to fabricate pipework from a detailed drawing within a set timeframe. Tasks include using permanent (brazed) and non-permanent (flared) joints, pipe bending techniques, and flame brazing with 15% and 40% silver/copper alloy. The finished system must be sealed and ready for pressure testing. Soft copper pipe and required materials will be supplied.

Electrical Testing and Fault Finding

Candidates must maintain a safe working environment while performing electrical testing and fault finding on a system that may also be used for refrigerant handling. Tests must ensure the system does not trip the main breaker when powered. Functional checks include confirming no voltage is present before earth continuity testing, verifying all terminations, and completing an electrical test record.

Refrigerant Handling

Candidates must safely carry out refrigerant recovery, pressure testing, evacuation and charging on an existing system, in any order required. Documentation must be completed, including:

- F-Gas Records
- Pressure Test Record
- Evacuation Test Record
- Commissioning Test Record

Refrigerant must not be contaminated with non-condensable gases, and charging procedures must follow best practice to minimise emissions.

HOW YOU'LL BE JUDGED

To ensure the integrity and standard of the competition, the competition will be judged by independent industry personnel against a consistent marking schedule. External verification will be conducted by both BESA and WorldSkills UK staff.

EXTRA GUIDANCE & SUPPORT

A competition training guide is available from the Competition Organising Partner (BESA) which contains useful hints and tips for what the judges are looking for and the quality of work and tolerances connected to the marking schedule.

PREPARING FOR THE WORLDSKILLS UK FINALS

A one day training event will be organised for those competing in the final, the training will be designed to enhance the competitor's preparation for the WorldSkills UK Final. This training will be scheduled for October with additional details provided closer to the event.

The training event will be supported by WorldSkills UK, Competition Organising Partner and Sponsors. The typical makeup of the event may be:

- WorldSkills UK competition brief, detailing the expectation and management of the WorldSkills UK Final
- WorldSkills UK competition rules and requirements
- Health and Safety requirements for the duration of the competition
- RACHP system principles training for efficient system set up
- Flame brazing training for similar and dissimilar metals
- Electrical installation
- Time management training
- Other relevant sessions

WORLDSKILLS UK NATIONAL FINAL

The WorldSkills UK Final is held in November, the competition generally runs over a 3 day period with the candidates expected to arrive the day prior to the start, for an induction and familiarisation session.

Candidates will be competing for the Bronze, Silver and Gold Medals.

WHAT HAPPENS AFTER THE NATIONAL FINALS

The WorldSkills UK national finals serve as part of the selection process for WorldSkills International competitions, identifying potential UK squad members for future WorldSkills competitions.

WorldSkills International training managers will be onsite at competitions, monitoring the performance of age-eligible candidates. Those who demonstrate exceptional skills, passion, and drive may be invited to train for WorldSkills international competitions.

For full eligibility details, visit the WorldSkills International website at www.worldskills.org. Age-eligible candidates will be notified during the competition.

Candidates not eligible for international events may join the Champions programme, offering continued involvement and opportunities to inspire the next generation by engaging with schools, colleges, and events.

Alternatively, if you're interested in training, consider supporting WorldSkills UK by helping organise and run the National finals.

Get inspired and join Team UK today!



JUDGES TOP TIPS

Preparation and Practice

Competitors must be confident, calm and self-assured when competing. Practice skills and techniques thoroughly to achieve the desired standards and results, minimising any unexpected issues.

Time Management

Effective time management is crucial for completing tasks efficiently. Focus on working smart rather than fast. Practice adhering to the allocated times and handling pressure to perfect timings. Running out of time during a competition will result in lost marks.

Planning

Develop individual plans for completing each task, work methodically and even write them down to aid preparation. Copying another competitor is not beneficial.

Organisation

Ensure all stages of a task can be completed efficiently by organising all necessary equipment and materials in advance. Maintaining a tidy work area enhances efficiency and eliminates hazards.

Health and Safety

Competitors must ensure the use of appropriate personal protective equipment (PPE) for each task and to maintain safe working practices.

Understanding

Thoroughly read the instructions to ensure a clear understanding of the requirements and don't hesitate to ask questions to seek clarification.

Concentration

If a part of the task has not went to plan, do not dwell on it, draw a line under it and proceed with the next task. Concentrate on the marks that can be gained not on what marks that might have been lost.

Enjoy

Being part of the WorldSkills UK competition is a significant achievement. Make the most of the experience and remember to enjoy yourself.

COMPETITION RULES AND CODE OF CONDUCT

To ensure the display of the expected standards, practices and rules, all candidates are required to be fully aware and act in accordance with the following competition rules and code of conduct. This aims to ensure fairness, transparency, and equality, and must be observed at all competitions organised by the Competition Organising Partner (COP) and its associates. Breaches of these rules may lead to the exclusion from the competition.

The following competition rules and code of conduct are in addition to those applied by WorldSkills UK.

1. Candidates are expected to always demonstrate exemplary and professional conduct, in their work practices, communication with judges, communication with the skills team and other candidates or general members of the public. This applies to any activity or location associated with the competition such as, competition venue, accommodation, restaurant
2. Dress code is smart casual
3. The design and specification of all competition tasks are the property of the COP. Unauthorised copying, use or removal is not permitted unless prior written permission has been obtained from the COP
4. The COP and its sponsors/supporters reserve the right to prohibit any unauthorised use of promotional materials within the competition area
5. Candidates may be required to cover the cost of accommodation and travel to and from the competition venue
6. Where accommodation is provided by the COP and its sponsors/supporters, it is for competitor sole use only
7. Where accommodation is provided by the COP and its sponsors/supporters, high standards of occupancy is expected, damages and/or breakages that may occur are the responsibility of the competitor
8. Candidates are required to be punctual for the start and duration of the competition day
9. Candidates will be provided with an identification badge this requires to be worn when outside of the competition area

COMPETITION RULES AND CODE OF CONDUCT

10. The use of alcohol and non-prescribed drugs is not permitted at any time during a competition event
11. Candidates shall always observe health and safety requirements
12. All accidents and sickness shall be brought to the attention of the COP
13. It is the responsibility of the competitor to use and wear the appropriate personal protective equipment during the competition event
14. Smoking and or vaping is only permitted within approved designated areas
15. Mobile telephones or recording devices cannot be used within the competition area unless authorised by the COP
16. All breaks shall be taken away from the competition area. Breaks should not be used to view other competitor's work/work area
17. Candidates shall not discuss competition drawings or tasks with any third party during the competition timeframe
18. Candidates shall not get involved in conversations with third parties during the competition timeframe
19. Candidates may only leave the competition area for designated breaks, any person wishing to leave the stand at any other time should obtain permission from the COP
20. Candidates are prohibited from using pre-drawn plans/templates/photos within the competition area
21. Candidates shall not borrow tools or test equipment from another competitor unless authorised by a judge
22. Candidates must request that a judge witnesses specific test procedures during the competition
23. Candidates shall ensure that all working areas are left clean and tidy at the end of each day
24. Photographs or video taken during the competition by the COP and its sponsors/supporters may be used for marketing and promotional purposes, prior consent from candidates will be obtained.
25. Where required, WorldSkills UK will provide arbitration to any disputes identified

