

RAC Service and Maintenance, Including F Gas Assessment

This five day course enables a novice to understand how an RAC system works and be able to maintain and service it. The following topics are included in the standard course:

- How a system works – the basic principles
- Common components - what they do and range of types
- Refrigerants, associated hazards and environmental issues, and legal responsibilities
- How systems are controlled
- Typical system operating conditions
- Introduction to brazing
- System processing – pressure / leak testing and evacuation
- Refrigerant handling – charging and recovering
- Setting controls
- Fault finding
- Maintenance for reliability and optimum performance
- Overview of design and installation



The course is a mix of theory, practical, discussion sessions and “toolbox talks” with the emphasis on active participation. Numbers on the course are usually limited to six, enabling us to tailor the course to suit the individual trainees during the week. Trainees are provided with high quality course notes. The course is run at our training centre in the West Midlands and can be tailored to suit individual RAC sectors, businesses and equipment types.

The City and Guilds 2079-11 refrigerant handling assessment is included within this course.

Cost

£1195 + VAT, including course notes, lunches, City and Guilds registration and certification.

About Cool Concerns' Training and Assessments – for engineers by engineers

Training and assessments are carried out by the working directors – Jane Gartshore and Stephen Benton – and by specialist trainers. We are all refrigeration engineers and have a wide and varied range of practical experience within the refrigeration and air conditioning industry.

We provide training that “hits the spot” – it is relevant, informative and fun with the emphasis on hands on practice mixed with high quality theory presentations.



All our training is designed to use trainees’ time as efficiently as possible, thus minimising expensive down time. We draw on the wide range of experience of all trainers to prepare high quality training sessions.

City and Guilds 2079-11

Cool Concerns Ltd is approved by City and Guilds to assess candidates for the C & G 2079 refrigerant handling scheme. This is a practical skills test plus an online assessment to check knowledge.

The overall aim of the assessment is to ensure candidates:

- Handle refrigerant safely and with minimum loss to atmosphere;
- Minimise refrigerant leakage and leak potential;
- Maximise energy efficiency.

It is a legal requirement that all engineers who handle HFC type refrigerants have this qualification (or the Construction Skills equivalent) by July 4th 2011. Until then the City and Guilds 2078 (or CITB equivalent) is acceptable. The category 1 assessment is for engineers working on any size of system who will be accessing the system (e.g. for service), charging and recovering refrigerant and leak testing. The assessment takes a full day.

Practical assessment

Engineers are required to carry out the following procedures on a test rig:

- Braze a joint and install it in the system;
- Pressure test the system for strength and leak tightness (including the brazed joint);
- Evacuate the system;
- Charge a zeotropic blend (e.g. R404A), run the system, check the refrigerant state;
- Carry out a visual check for leaks, indirectly assess the system for low charge and leak test using an electronic leak detector;
- Fit & disconnect gauges on the running system with service and Schrader valves;
- Recover the refrigerant;
- Drain oil from a compressor.



The test rigs are industry standard air cooled condensing units coupled with DX evaporators, as shown in the photo.

Knowledge assessment

Knowledge is assessed online using the City and Guilds GOLA (Global On Line Assessment) facility at Cool Concerns. The following topics are included in the 40 question multiple choice assessment:

- SI units of measure;
- Basic refrigeration theory, pressure enthalpy charts, function of components, state of refrigerant in the system, operating conditions;
- Monitoring system performance and indications of leakage;
- Environmental aspects - direct and indirect - of HFCs and HFC systems, including energy efficiency;
- Environmental regulations;
- Required record keeping;
- Potential leak points;
- Handling of contaminated refrigerant and oil;
- Component function and associated leak risk.



The procedure for the online assessment is explained prior to the assessment.

Course Extension – Brazing and Troubleshooting

A two day extension is available which provides more in depth information about:

- Brazing – the British Refrigeration Association's brazer scheme assessment is included which is a multi-joint test piece, copper to copper and copper to steel, in a range of sizes. Appropriate practical training is also provided;
- Troubleshooting – guidance is provided on fault diagnosis, with examples and plenty of time for discussion.

This session takes place on the Saturday and Sunday following the five day course.

The additional cost is £375 + VAT per person.

Refrigerant Handling Legislation

Fluorinated Gases "F gases" are a family of chemicals that contain fluorine. Most "F gases" are very powerful greenhouse gases which contribute to climate change if emitted to the atmosphere.

Many organisations have obligations under the EC F Gas Regulation. In particular, if you use, maintain or install refrigeration and/or air-conditioning equipment you are likely to be affected. Refrigeration and air-conditioning users may also be affected by the EC Ozone Regulation which is phasing out certain ozone depleting substances (ODS) such as R22.

One of the requirements of the F Gas regulation is a minimum standard of competency for engineers handling HFC refrigerants (such as R404A, R407C, R134a, R410A). City and Guilds 2078 and the CITB equivalent are acceptable until July 4th 2011. By this date all HFC handlers will have to have the new qualification - City and Guilds 2079 (or the Construction Skills equivalent).

For more information on the legal requirements contact Cool Concerns Ltd or visit F Gas Support at <http://www.defra.gov.uk/environment/air-atmos/fgas/index.htm>