



AIR CONDITIONING

RED DRAGON AIR CONDITIONING LTD

Unit 6, Sturmi Way, Village Farm Industrial Estate, Pyle, Bridgend, CF33 6BZ
Tel: 01656 743661 / 0777 6207563

AUTOMOTIVE & COMMERCIAL

AIR CONDITIONING & REFRIGERATION COURSES 2014/2015





RED DRAGON AIR CONDITIONING LTD

NEW 1-DAY CITY & GUILDS 7543-001 'LEVEL 3' AUTOMOTIVE AIR CONDITIONING COURSE

This 1-day City & Guilds certificate in 'Safe Refrigerant Handling for Mobile Air Conditioning Systems' (MACS) is the first module of a Level 3 certificate in Automotive Air Conditioning. It has been designed to offer the necessary training and subsequent qualifications necessary to satisfy the new European Union legislative changes and is aimed at anyone in the automotive industry from the mobile mechanic to large garages or workshops.

Our instructor is an approved City & Guilds and CITB instructor/assessor who has over 25 years of automotive experience and can offer invaluable advice and tips to our students.

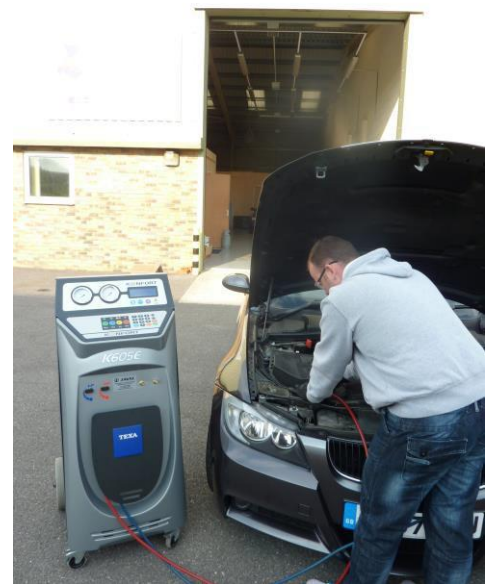
The following information details the course content and what you can expect to gain from the course. Timings have been purposely omitted as we proceed through the course at a pace which suits the students; this is to ensure that everyone gets the maximum benefit from our instruction.

What is covered?

Day 1 – (approximately 60% theory and 40% practical)

- Introduction and administration
- Ozone depletion & global warming
- Montreal Protocol, Kyoto Protocol, EC Regulation 842/2006
- Health & Safety
- COSHH
- Theory of heat transfer
- A/C terminology
- Identification of common refrigerants
- Refrigerant condition & state
- A/C system components
- System operation (vapour compression cycle)
- Servicing (Refrigerant recovery, system evacuation, re-charging, adding oil/UV dye, records and reports)

- City & Guilds practical and theory assessment



What You Can Expect To Gain from the Course

This course will provide students with everything they need to know in order to carry out basic automotive air conditioning servicing tasks on their own (including cars, trucks, PCV's, boats, plant, and agricultural equipment) **using an automatic service station.**

We have a fully operational purpose built training rig which allows students to study all the working parts of a complete automotive air conditioning system.

All equipment used during the course is of excellent quality and students attending these courses are able to purchase a variety of equipment (including complete start-up packs) at discounted prices.

Location & Accommodation

The course is held at our purpose built training facilities in Bridgend, South Wales, just 1 mile from J37/M4.

Cost

The cost of this 1-day course is **£175.00 + VAT = £210.00** and includes course reference material, refreshments (tea, coffee & biscuits) and lunch!

If you have any further queries, please feel free to contact us on the numbers below to discuss things further or visit www.red-dragon-airconditioning.com and select the relevant tabs at the top of the welcome screen.

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RED DRAGON AIR CONDITIONING LTD

2-DAY CITY & GUILDS 7543-001 'LEVEL 3' AUTOMOTIVE AIR CONDITIONING COURSE

This 2-day City & Guilds certificate in 'Safe Refrigerant Handling for Mobile Air Conditioning Systems' (MACS) is the first module of a Level 3 certificate in Automotive Air Conditioning. It has been designed to offer the necessary training and subsequent qualifications necessary to satisfy the new European Union legislative changes and is aimed at anyone in the automotive industry from the mobile mechanic to large garages or workshops.

Our instructor is an approved City & Guilds and CITB instructor/assessor who has over 25 years of automotive experience and can offer invaluable advice and tips to our students.

The following information details the course content and what you can expect to gain from the course. Timings have been purposely omitted as we proceed through the course at a pace which suits the students; this is to ensure that everyone gets the maximum benefit from our instruction.

What is covered?

Day 1 – (approximately 60% theory and 40% practical)

- Introduction and administration
- Ozone depletion & global warming
- Montreal Protocol, Kyoto Protocol, EC Regulation 842/2006
- Health & Safety
- COSHH
- Theory of heat transfer
- A/C terminology
- Identification of common refrigerants
- Refrigerant condition & state
- A/C system components
- System operation (vapour compression cycle)
- Servicing (Refrigerant recovery, system evacuation, re-charging, adding oil/UV dye, records and reports)



- **Day 2** – (approximately 20% theory and 80% practical)
- **City & Guilds practical and theory assessment**

What You Can Expect To Gain from the Course

This course will provide students with everything they need to know in order to carry out basic automotive air conditioning servicing tasks on their own (including cars, trucks, PCV's, boats, plant, and agricultural equipment) using portable service equipment.

This course is aimed at those who are looking to provide a mobile air conditioning service to their customers using portable equipment as opposed to the 'Automatic Service Stations'.

NB> The refrigerant handling techniques developed during this course will provide the necessary '**Entry Level Requirements**' for future courses such as the Split System Installation course and F-Gas courses.

All equipment used during the course is of excellent quality and students attending these courses are able to purchase a variety of equipment (including complete start-up packs) at discounted prices.

Location & Accommodation

The course is held at our purpose built training facilities in Bridgend, South Wales, just 1 mile from J37/M4. A list of discounted Hotels and B&B's is provided with the confirmation of course booking.

Cost

The cost of this 1-day course is **£350.00 + VAT = £420.00** and includes course reference material, refreshments (tea, coffee & biscuits) and lunch!

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2-DAY CITY & GUILDS 7543-002 'LEVEL 3' AUTOMOTIVE AIR CONDITIONING COURSE

This 2-day City & Guilds certificate in the 'Principles of Air Conditioning Systems' is the second module of the Level 3 Certificate in Automotive Air Conditioning. It has been designed to complement module 1 (7543-001) and take students to the next level of understanding the air conditioning system in more detail whilst also gaining an understanding of how to provide a more comprehensive air conditioning service for their customers. The additional knowledge and understanding of the air conditioning system gained during this course provides a good foundation for the purpose of fault finding and repair techniques.

There is so much more to servicing an air conditioning system than just a simple 're-gas'.

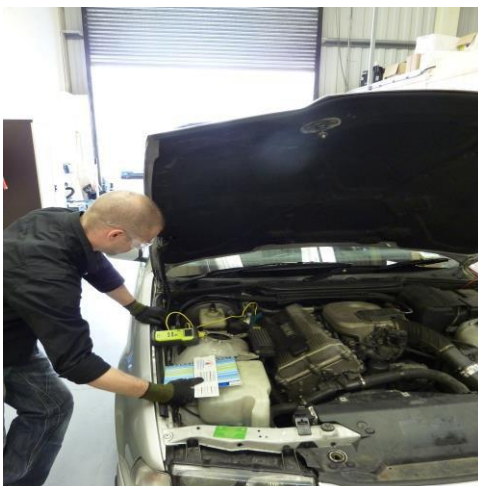
Some garages and air conditioning specialists are now offering Bronze, Silver or Gold standard services to their customers including - Evaporator Cleaning, Odour Removal, Performance Checks and Functional Checks. This helps to set themselves apart from the average service provider who is only trained to press buttons on an automatic service station in order to re-gas the air conditioning system.

The course is aimed at anyone in the automotive industry from the mobile mechanic to large garages or workshops but they **must** already hold the first module (7543-001).



Our instructor is an approved City & Guilds and CITB instructor/assessor who has over 25 years of automotive experience and can offer invaluable advice and tips to our students.

The following information details the course content and what you can expect to gain from the course. Timings have been purposely omitted as we proceed through the course at a pace which suits all students; this is to ensure that everyone gets the maximum benefit from our instruction.



Topics Covered

- The Principles of Air Conditioning (In depth)
- Inspecting and Testing the Air Conditioning System
- Servicing Checks using a Comprehensive Checklist
- Evaporator Cleaning
- New! - Odour Removal
- Leak Detection (Various Techniques)
- New R1234yf Systems, Servicing Techniques and Specialist Equipment

What You Can Expect To Gain from the Course

This course covers system operation in a lot more depth than the first module therefore providing the student with a much better understanding of how the system works. Knowing how something works goes a long way toward being able to identify faults. This leads to the student feeling much more confident in their ability to not just 're-gas' a system, but to confirm that the system is operating correctly by carrying out additional functional and performance checks. Any observations about poor or incorrect system performance can be communicated to the customer and therefore prevent unnecessary system damage or component failure.

This course is essential for those who want to offer their customers more than a simple re-charge to their vehicle air conditioning system.

Location & Accommodation

The course is held at purpose built training facilities in Bridgend, South Wales, just 1 mile from J37/M4. A list of discounted Hotels and B&B's is provided on confirmation of course booking.

Cost

The cost of this 2-day course is **£350.00 + VAT = £402.50** which includes all registration and certification fees, the course reference material, refreshments (tea, coffee & biscuits) and a full lunch.

Students wishing to attend this course must have already completed 'Module 1'. This course is proving very popular for those not seeking to achieve all 3 modules of the Level 3 Certificate but who need this level of understanding for their line of work.

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COMBINED 5-DAY AIR CONDITIONING SYSTEM INSTALLATION WITH F- GAS CATEGORY 2

The following information details the course content and what you can expect to gain from the course. Timings have been purposely omitted as we proceed through the course at a pace which suits the majority of the students; this is to ensure that everyone gets the maximum benefit from our instruction.

Topics Covered

Day 1 – (approximately 80% theory and 20% practical)

- Introduction and administration
- Law & legislation (Montreal Protocol, Kyoto Protocol, British Standards etc.)
- Ozone depletion & Global warming
- Health & Safety
- COSHH
- The 4 functions of an A/C System
- Theory of heat transfer
- A/C terminology
- Pressure/Temperature relationship
- Identification of common refrigerants
- A/C system components and system configuration
- System operation (refrigeration cycle - heating & cooling modes)
- Identifying the condition and state of a refrigerant
- Requirements for the safe disposal of waste refrigerants



Day 2 – (approximately 20% theory and 80% practical)

- Pipe joining (pipe flaring, swaging, brazing and compression fit joints)
- Pressure Testing (Strength & Leak testing to BS EN 378:2:2008 Standards)
- System evacuation
- Charging system with refrigerant blend
- Leak detection (Oxygen Free Nitrogen, Lock Trace, Bubble Solutions, Electronic Leak Detectors)
- Refrigerant recovery



Day 3 – (approximately 30% theory and 70% practical)

- Pipe Insulation and fixing
- Condensate drainage & Condensate pumps
- Indoor & Outdoor unit location and mounting
- System efficiency checks including commissioning checks
- Report requirements

Day 4 – (approximately 30% theory and 70% practical)

- Continuation of practical training in preparation for practical assessment
- Safe brazing techniques and brazing test piece
- ‘Pressure Enthalpy’ diagrams

Day 5 – (50% theory and 50% practical)

- **CITB practical assessment**
- **CITB theory assessment**
- End of course discussions and future F-Gas proposals
- Course dispersal

What You Can Expect

The 5-day course will provide students with theoretical and practical skills required to carry out a ‘Split System’ installation and Safe Refrigerant Handling in accordance with current F-Gas Regulations. This course is ideal for Gas, Electrical or Plumbing technicians who are looking to expand their service capabilities. Many of the new ‘Heat Pump’ and ‘Renewable’ technologies are equipped with a refrigeration circuit which cannot be worked on legally by anyone who does not hold the relevant F-Gas certificate.

Cost

The cost of this 5-day course is currently **£625.00 + VAT** and includes refreshments throughout the day (tea, coffee and biscuits) and lunch. Courses are currently scheduled to be run once a month but additional courses may be introduced to cater for any increase in demand.

Entry Level Requirements

You are required to have previous qualifications or experience in air conditioning/refrigeration or similar trade disciplines e.g. Gas, Electrical or Plumbing.

If you do not meet the Entry Level Requirements we can offer a short pre-course (1-day) in order for you to qualify to attend this course. This training can also be provided during the evenings of the 5-day course, thus allowing you to qualify in just 5 days.

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F-GAS CATEGORY 1

The following information details the course content and what you can expect to gain from the course. Timings have been purposely omitted as we proceed through the course at a pace which suits the majority of the students; this is to ensure that everyone receives maximum benefit from our instruction.

Topics Covered

Day 1 – (approximately 80% theory and 20% practical)

- Introduction and administration
- Law & legislation (Montreal Protocol, Kyoto Protocol, British Standards etc.)
- Ozone depletion & Global warming
- Health & Safety
- COSHH
- Theory of heat transfer
- A/C terminology
- SI Units
- Pressure/Temperature relationship
- Identification of common refrigerants
- System components and system configuration
- Vapour compression cycle
- Identifying the condition and state of a refrigerant
- Requirements for the safe disposal of waste refrigerants



Day 2 – (approximately 30% theory and 70% practical)

- Pipe joining (pipe flaring, swaging, brazing and compression fit joints)
- Pressure Testing (Strength & Leak testing to BS EN 378:2:2008 Standards)
- Leak detection (Oxygen Free Nitrogen, Lock Trace, Bubble Solutions, Electronic Leak Detectors)
- System evacuation (including demonstrations on how moisture is removed from the system)
- Refrigerant recovery
- Re-charging system with a refrigerant blend using various techniques (including rule of thumb)



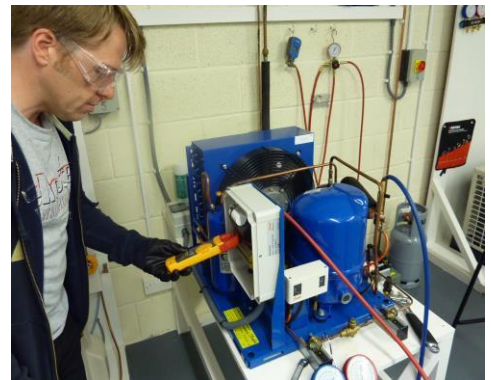
Day 3 – (approximately 50% theory and 50% practical)

- Description and use of 'Pressure Enthalpy' (Ph) diagrams
- System efficiency performance monitoring
- F-Gas Record & Report requirements
- Continuation of practical tasks associated with safe refrigerant handling



Day 4 – (10% theory and 90% practical)

- Practical and theoretical revision in preparation of both written and practical assessments
- Transfer refrigerant from cylinder to cylinder
- Drain oil from system
- Component Installation (Compressor, Condenser, TEV or Evaporator)
- Plotting Pressure Enthalpy Charts from measured data and calculating Coefficient of Performance (C.O.P.)
- Fault analysis using Pressure Enthalpy Diagrams



Day 5 – (50% theory and 50% practical)

- Practical assessment
- Written Assessment (Multi-Choice – Open Book Paper)
- End of course discussions and future F-Gas proposals
- Course dispersal

What You Can Expect

The 5-day course will provide students with sufficient theoretical and practical skills to:

- Fabricate & fit mechanical and brazed joints
- Pressure test and evacuate to BSEN378
- Charge a blended refrigerant
- Analyse system performance to ensure efficiency (using pressure, temperature, refrigerant state and rule of thumb)
- Leak test to EC1516/2007
- Maintain 'F Gas' log books and records
- Handle refrigerant safely & dispose of legally
- Ensure systems are tight, efficient in their use of energy and meet the F Gas legal requirements

Cost

The cost of this 5-day course is currently **£725.00 + VAT.**

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LEVEL 2 AND 3 PIPEWORK & BRAZING COURSE

The following information details the course content and what you can expect to gain from the course. Timings have been purposely omitted as we proceed through the course at a pace which suits the majority of the students; this is to ensure that everyone gets the maximum benefit from our instruction.

Topics Covered

Day 1 – (approximately 80% practical and 20% theory)

- Introduction and administration
- Health & Safety Awareness
- Theory and techniques of soldering and brazing (hard soldering)
- The properties of different metals used in brazing
- Introduction to the equipment used for brazing
- Types of filler rods used in brazing
- Types of fluxes used in brazing
- Cylinder safety including transport, storage and use
- Setting up the equipment safely (including leak checking)
- Setting the regulator pressures
- Lighting the torch
- Different types of flames and their uses e.g. neutral, carburising and oxidising flames
- Temporary shutdown procedure
- Full shutdown procedure
- Pipework preparation
- Purging with Oxygen Free Nitrogen (OFN)
- Practical exercises using copper/copper, copper/steel and steel/steel techniques
- Assessment – Candidates are required to cut and assemble copper and steel pipe as per the drawing of their test piece. This pipework exercise is required to be within the specified tolerances



Day 2 – (approximately 70% practical and 30% theory)

- Revision of lessons learned on Day 1
- Practical assessment
- Theory assessment
- Course debrief and dispersal



What You Can Expect

This is a level 2-Day course for those looking to achieve a formal qualification in the safe use of oxy-acetylene and current safe brazing techniques. More and more companies are insisting that personnel involved in air conditioning and refrigeration work hold a certificate in brazing as proof of competence and compliance to industry standards. This qualification can be included on the SKILL card.

A range of differing copper pipe sizes up to 7/8" will be used for the Level 2 certificate and up to 1 3/8" for the Level 3 certificate, along with the use of different materials and brazing alloys. Each candidate produce effective, leak free joints such as copper/copper, copper/brass, copper/steel and steel/steel using safe brazing techniques

Cost

The cost of this 2-day course is currently:

Level 2 certificate - £325.00 + VAT

Level 3 certificate - £350.00 + VAT

Level 2 1 day Renewal - £175.00 + VAT

Level 3 1 day Renewal - £195.00 + VAT

Entry Level Requirements

There are no entry level requirements for this course

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1-Day CITB F Gas Renewal Course £245.00 + VAT

Changes to the original F Gas Regulation 'EC 842/2006' have now been released in the updated version of the F Gas Regulation 'EC517/2014'.

Areas of the original regulations which had been identified as either vague or weak by the UK industry have now been accepted within the 'New F Gas Regulation'. This is of major importance to air conditioning and refrigeration companies and engineers as new requirements relating to leak checking, documentation and phase out dates of certain refrigerants are about to change.

This 1-day course is aimed at those who have continued to work primarily in the air conditioning and refrigeration industry since achieving the initial F Gas certificate.

The course will cover changes to the original F Gas Regulation which will require implementation with effect from January 2015 onwards.

There are only 10 theory questions to be answered, which are mainly focussed on changes to legislation and some basic superheat and sub-cooling calculations.

If your F Gas certificate is due to expire, you will need to renew the certificate before the expiry date to remain legally covered.

The F Gas Renewal Course can be taken up to 6 months before the expiry date of the existing certificate. The new certificate will be dated 5 years from the expiry date of the original certificate which will allow businesses to plan for the required training well in advance.



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