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AIR CONDITIONING

Legal stuff

- CDM (maintenance of a system attached to a structure) L153 (All fixed HVAC)
- F-GAS Regulations (various and changing)
 - Engineers - C&G 2079 Cat I, SkillsCard/CSCS – ACRIB (blue or gold) .
 - Company – Notified body : RefCom, F-Gas Register or Bureau Veritas.
 - Leak testing and maintenance duties, site F-Gas logs, GWT CO²_{eq tonnes}
- Workplace Regs. R5 maintenance, R6 vent, R7 temp, (L24) RECORDS?
- Waste Carriers licences : spent gas = hazardous waste, filters (dust).
- Pressure Equipment Regulations / PED Cat II installer must be 'Notified Company' under PED / CE for system. Very few are.
- Special AC copper tubing. Beware domestic plumbing tuning and cheap quotes.
- Brazing qualifications for Cat II work: BRA – level 2 or 3 (CITB).
- DSEAR – Oxyacetylene for brazing, 'BCGA' CP7 inspections.
- [A guide to air conditioning inspections for buildings](http://www.gov.uk) (www.gov.uk)
- CIBSE TM44 inspection (more than 12 kW system, **5 years old or more, every 5 yrs.**)
- Brazing and spent gas/oil – turns to Phosgene. Ventilation issues.
- Access. WAH. How do you get to the units? Desks, roof void access.
- 'Adiabatic' Water cooling needs L8 and 'notified cooling tower' to LA.

Safety Considerations

Customer-
"Well no one else has
had a problem with
working down there!"



RAMS – Often missed

- Hot works, PWT, Isolations, Fire watch, Extinguisher?
- Work at Height – rescue plans, roof safety, ladders, mewps, towers. Radiation risks.
- HAVS – from ceiling/wall fixings / coring
- Noise – on sites and from drilling.
- Pressure testing to 47 Bar (680 psig). Old Fittings? Test kit with sight glass? UKAS certified kit? Are they using filling kit for pressure testing?
- Fire containment – repair of breaches, are they qualified? Pink Foam?
- Manual handling – Gas cylinder quoted as 13kg. This is the gas, the cylinder weights 26kg. Route, location of kit, access, compressors 45 to 90 kgs – How?

OLD GAS – R410A or R407c

- Inert gas and oils at 43 Bar (624 psig) in working system. Soda bottle at 3.2 to 3.7 Bar (25°C), tyres typically 2 Bar, blowout of tyre has killed.
- If it leaks, the volume of gas in the entire system/circuit must be below its ability to replace the oxygen within a room. Check the design calculations.
- Gases are mixtures with different evaporation rates, if it does leak, it all has to be removed and renewed.
£650 for 10kgs
- Major sudden leak (rare) can destroy a data centre. Atomised oil mist in the server drives.

NEW GAS

- R32. Difluoromethane is a HFC refrigerant, used as a replacement for R410A in low temperature refrigeration and air conditioning applications. This refrigerant is a preferred replacement for R410A in new equipment. **R32 is not to be used as a retrofit.**
- **Mildly flammable.** Low flammable range (14 to 31%) and poor propagation. A2L, Flammable Gas Category 1. Ignition point around 620 °C. Most brazing is a little hotter! Needs sustained heat source to burn. Spark should not cause issues.
- **Heavier than air.** Drain and trenches? Can not be used in basements or 'confined' spaces.
- Limited systems size, mainly smaller systems.
- Requires intrinsically safe equipment.
- Most engineers have old kit, may try to use with R32
- Storage requires same precautions as for any flammable gas cylinders. Cages/Signage etc.



HEALTH AND SAFETY IN HVAC

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