

Training for Industry

MCERTS Level 1 – Technician

This course is designed to provide an introduction in Emission Monitoring and to train the delegate to MCERTS Standard Level 1.

Who should attend

This course is for personnel with little or no experience in emission monitoring or who are at the Trainee level of MCERTS and wish to progress to Level 1.

Syllabus



- an overview of legislation on emissions to air, IPC, PPC, European directives and the MCERTS scheme;
- the nature and use of emissions limits;
- monitoring requirements
 - sampling protocols
 - standard methods
 - MCERTS method implementation documents
 - instrument specification and approval
 - principles of quality assurance and control;
- the importance of representative sampling;

Units and reference conditions

- temperature, pressure, velocity, mass, volume;
- concentration and mass-based units;
- inter-conversion of ppm and mg/m³;
- reference conditions and normalisation
- conversion of wet gas composition to dry gas
- conversion to standard temperature and pressure
- conversion to reference levels of O₂.

Introduction to major pollutants

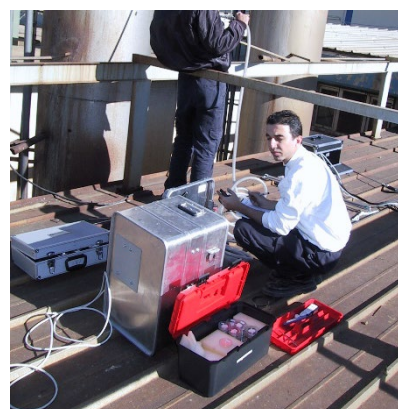
Principal pollutants prescribed for monitoring and their properties. The following pollutants are included: CO, CO₂, O₂, SO_x, NO_x, HCl, TOC, particulate matter, dioxins, PCBs and PAHs.

- typical sources;
- factors affecting formation;
- typical emission concentrations;
- typical ambient concentrations;
- properties affecting sampling and analysis;
- environmental and health effects of air pollution.

Principles of emissions monitoring

Principles of stack-emission monitoring and the reasons it is carried out. This includes:

- purpose of monitoring for regulatory compliance



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Operation of equipment

General requirements for correct operation of measurement equipment and have an understanding of common faults and their effects. This includes:

- use of CEMs;
- instrument theory
 - flow measurement theory of pitots, orifice plates, dry gas meters, rotameters, differential pressure devices
 - temperature measurement, theory of measurement including thermocouple and other devices
 - pressure measurements devices and theory of operation
 - heater technology;
- practical knowledge
 - handling of basic technical equipment
 - training in the handling of instruments
 - practical demonstration of the different applications of sampling.

Introduction to extractive manual sampling

The candidate should demonstrate general knowledge of the equipment used for sampling particulates, multi-phase emissions and gases/vapours. This includes:

- principle of operation;
- general arrangement of the sample train
 - sample (hot) box or oven
 - cold box or ice bath
 - umbilical cord
 - control unit;
- general methodology for determination of substances

- particulates
- dioxins and PCBs
- PAHs
- trace metals including mercury
- gases/vapours using manual and instrumental techniques
- water vapour and presence of droplets
- preparation of sampling equipment
 - filter preparation
 - polymeric resin trap preparation
 - glassware preparation
 - probe liner preparation
 - nozzle preparation
 - preparation of sampling train and leak check
 - example arrangements of sampling trains.

Principles of manual stack-emission monitoring

- special characteristics of particulates;
- the need for and principle of isokinetic sampling;
- effects of water droplets;
- sampling plane and sampling points;
- measurement of stack gas velocity and pressure;
- calculation of flow rate (orifice plate, manometer);
- setting flow rate (setting charts, calculators, portable computer equipment and the like);
- calibration of instrumental techniques;
- sample conditioning and sample integrity.