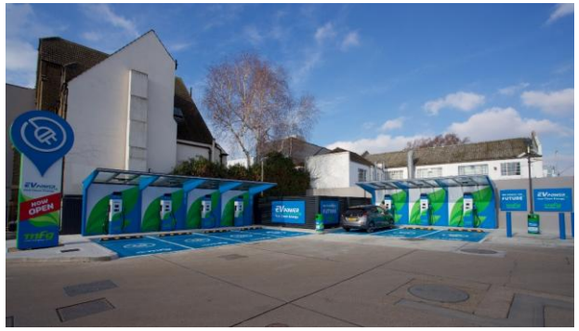
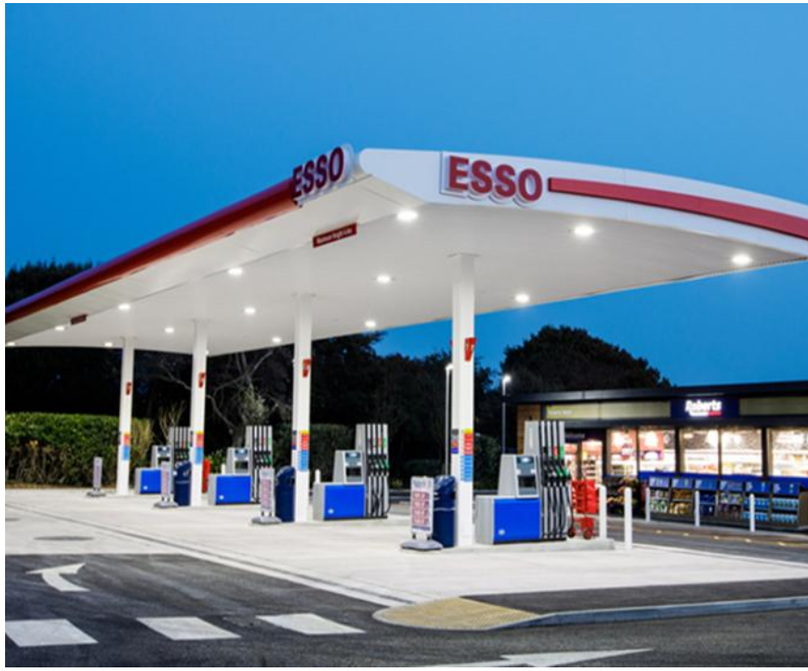
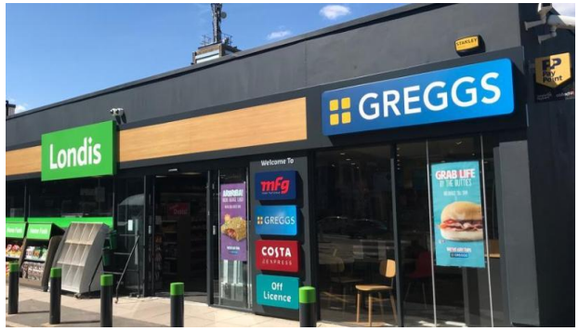
Life Saving Rules

05

Gas Testing







Life Saving Rules 05: Gas Testing

Gas testing is an essential activity that is crucial in ensuring the safety of workers in workplaces were there is a potential for a hazardous atmosphere to exist

- The process involves testing the atmosphere in a specific work area to identify any hazardous:
  - Gases
  - Vapours; or
  - Fumes
- That may pose a threat to human health, cause explosions or fires

Life Saving Rule:

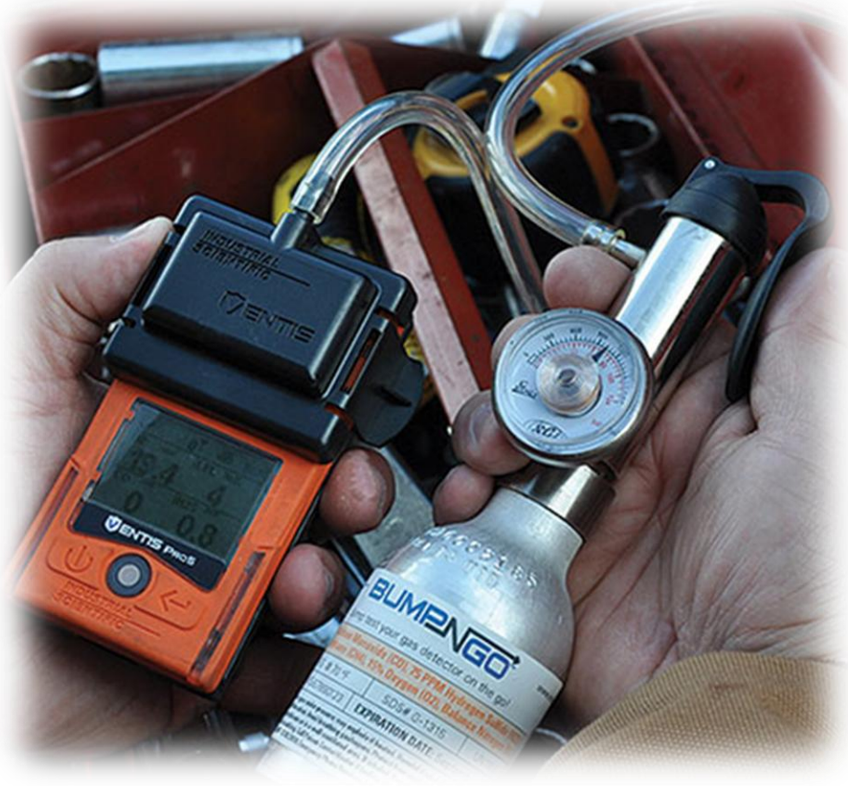
- When performing work activities that have the potential to expose you to hazardous atmosphere, **YOU MUST**:
  - Conduct a hazard assessment and identify the risks
  - Identify any potential exposure to hazardous gases or vapours
  - Confirm that gas testing has been performed:
    - By a qualified person; using
    - Suitable, certified and calibrated gas detecting instrument
  - Verify that gas testing results are:
    - Within acceptable tolerance limits; and
    - Accurately recorded for reference purposes

Life Saving Rules 05: Gas Testing

Portable gas detector equipment will be used to test and monitor atmospheric conditions at a job site

- This type of equipment includes:
  - Battery operated handheld pump type detectors; and
  - Personal monitors worn by workers to protect against identified vapours of concern, for example:
    - Depleted or enriched oxygen
    - Flammable vapour
    - Hydrogen sulphide; and
    - Carbon Monoxide
- Typically:
  - Handheld pump type detectors are used to test for potentially hazardous atmosphere in the workplace prior to starting work; and
  - Personal monitors are worn during specific tasks jobs or in specific work environments to alert the wearer to a potentially hazardous condition
- Gas detection equipment should be comprised of:
  - Gas detector and manufacturer's handbook
  - Spare batteries and/or an approved battery charger
  - Bump Test equipment (where applicable); and
  - Manufacturer specified accessories and spare parts
- If levels of hazardous vapours exceed prescribed safe limits, gas detectors will transmit warnings via audible and visible signals
- Gas detectors used must be suitable for:
  - The potential hazardous vapours; and
  - Range of concentrations; that may be present or that may come to be present, at the job site

Performing Bump Test (If Required)



Life Saving Rules 05: Gas Testing

Detectors must be inspected and tested before use by a trained and 'Authorised Person'.

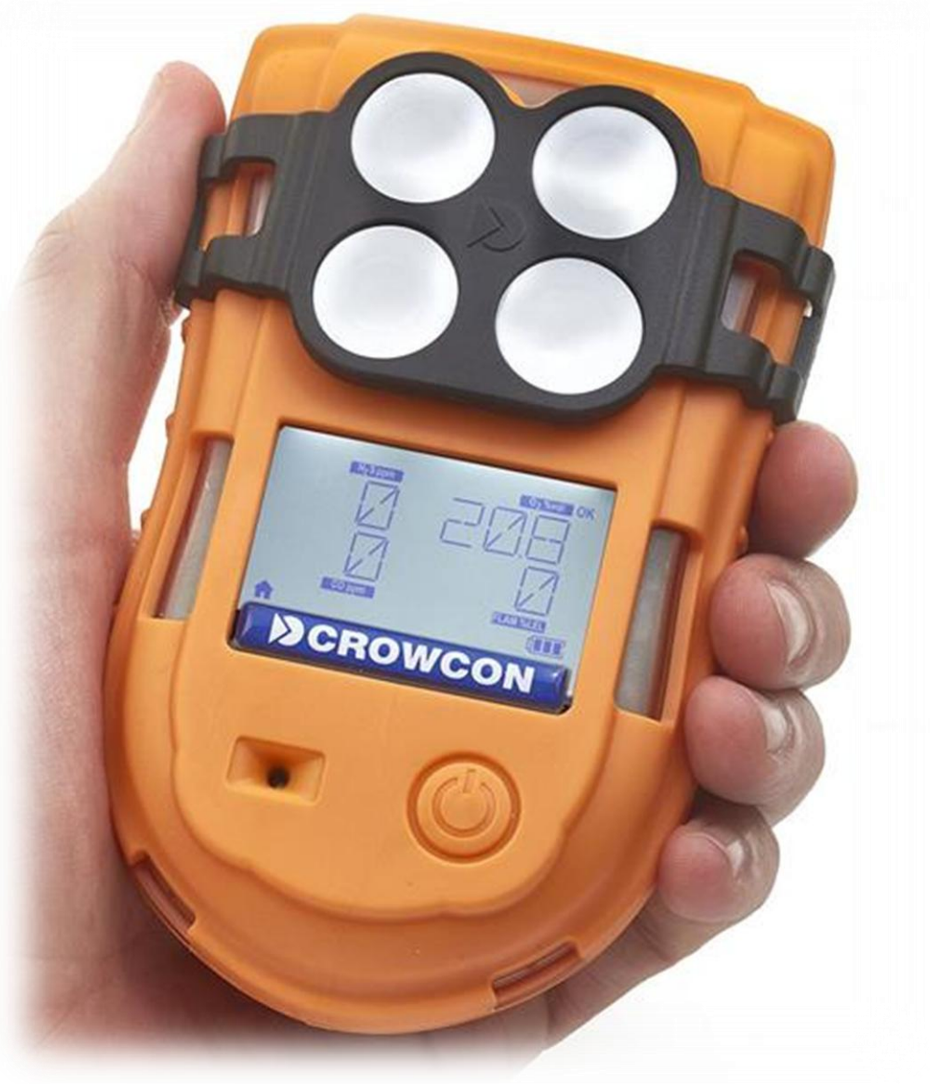
- They will carry out the following:
  - **Visual Check:**

    A check to ensure that the detector is complete in all aspects, undamaged and operators in accordance with design intent.
  - **Functional Check:**

    Self-calibration check that is performed when the detector is first switched on, in a clean atmosphere, prior to use.
  - **Bump Test** *(i.e., if required by manufacturer)*:

    A qualitative function check, in which a challenge gas is passed over the sensor(s), at a concentration and exposure time sufficient to activate all alarm settings.
  - **Periodic Calibration** *(i.e., within test)*:

    Check performed to confirm that the sensor(s), and alarms respond within the manufacturer's acceptable limits by exposing the instrument to a test gas.



Portable gas detector that fails inspection and test will:

- Be removed from service
- Identified as '**Not To Be Used**'; and
- Not returned to service until:
  - Repaired; and
  - Re-calibrated; by a Competent Person

Life Saving Rules 05: Gas Testing

Portable gas detectors will be set to alarm at a specified gas concentration, or when a set point is exceeded:

- Gas detector alarms will:
  - Be audible and visible
  - Not stop or reset unless deliberate action is taken by the user; and
  - Set to alarm at a level designed to ensure the health and safety of personnel

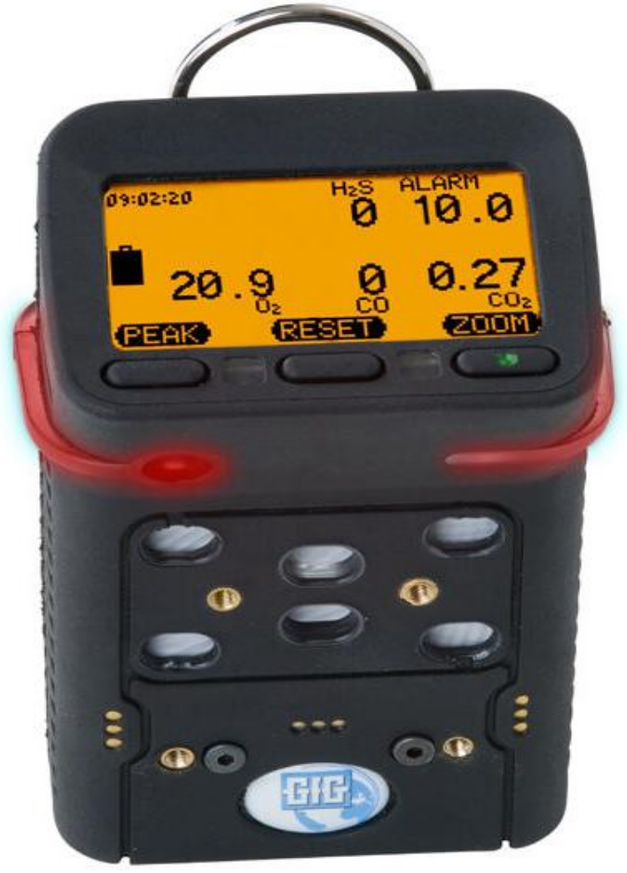
Gas detector alarm settings are:

- Oxygen: 19.5 to 23.0%
- Flammable Vapor: 10% LEL
- Hydrogen Sulphide: <10 ppm; and
- Carbon Monoxide <30 ppm

Safe levels to allow work to proceed are:

- Oxygen: 19.5 to 23.0%
- Flammable Vapor: <5% LEL
- Hydrogen Sulphide: <10 ppm
- Carbon Monoxide <30 ppm; and
- Benzene: <1 ppm

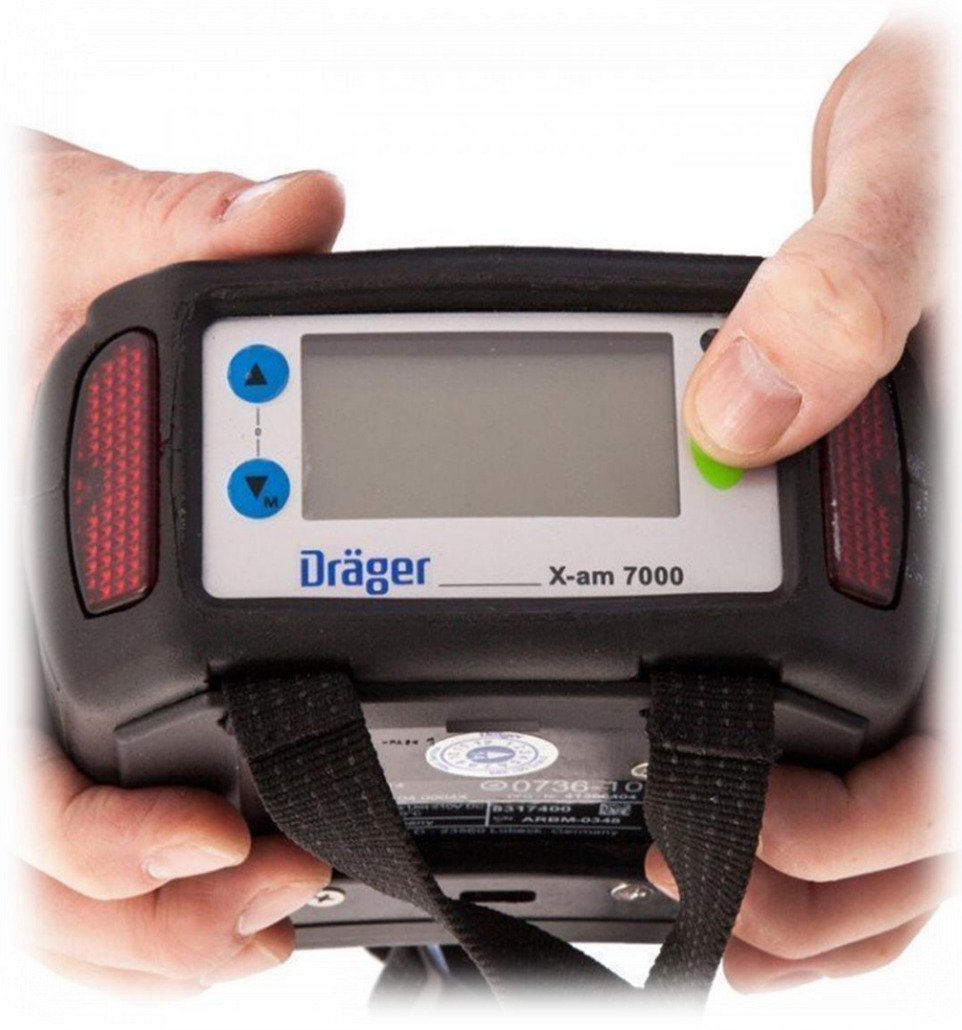
Note: *As a minimum gas testing and periodic gas monitoring will include oxygen and flammable vapour. The 'Authorised Person' is responsible for ensuring that all vapours of concern are identified prior to performing gas testing activities, and that relevant and proper testing for the identified vapours, is carried out.*



Life Saving Rules 05: Gas Testing

To perform a gas test, the Authorised Person will:

- Perform a job site hazard assessment to identify:
  - Potentially hazardous vapour of concern
  - The hazardous vapours to be tested
  - Workplace exposure limits (WELs) for each of the identified hazardous vapours; and
  - Types of testing required for the hazardous vapours
- Review the:
  - Risk Assessment and Method Statement (RAMS)
  - Clearance Certificate; and
  - Permit to Work; as applicable
- Wear the required PPE, including respiratory protection if
- Ensure the gas detector is suitable for use:
  - Correct type and range of gas detector
  - Visually inspected for signs of damage
  - Calibrated, and within test; and
  - Bump tested, if applicable
- Only use the manufacturer's recommended accessories
- Switch on the gas detector in a clean atmosphere, and allow the instrument to self-test; and
- Allow sufficient time for the instrument to stabilize if stored at a temperature significantly different (+/-10^{o}C) to the area where gas testing is required



Life Saving Rules 05: Gas Testing

The Authorised Person will:

- Take readings from the:
  - Perimeter of the worksite to the place of work; and
  - Worksite and surrounding area (e.g., within a 25-feet radius)
- Take vapour reading, as applicable, at:
  - Ground level
  - Workers breathing zone
  - Drain covers
  - Pipeline openings, flanges, and drains
  - Equipment connections points
  - Vent facilities
  - Sumps, pits, gullies, or drainage channels
  - Within a confined space

  ***Note: DO NOT ENTER**, use an extension wand*.
- Allow sufficient time for a sample to be drawn through the gas detector
- Avoid drawing water or chemicals into gas detector or exposing it to chemicals or substances that may poison the detector's sensors
- Continually monitor the gas detector and record the highest readings obtained

  ***Note:** Immediately exit the work location on detecting any reading of toxic or flammable vapors outside permitted limits.*
- Test for oxygen when testing for flammable vapors (LEL)

  ***Note:** some multi-gas detectors require a concentration of oxygen for the LEL sensor to function effectively*
- Record the gas test results (e.g., designated report form or PTW); and
- Authorise work to start if test results are within acceptable limits

Life Saving Rules 05: Gas Testing

The Authorised Person will communicate whether there is a requirement for periodic or continuous gas monitoring:

- The following apply to periodic gas monitoring:
  - Periodic monitoring will:
    - Be performed; and
    - The test results recorded; at intervals not exceeding one (1) hour
  - If periodic gas test reading differ from previous readings (e.g., >10% LEL or +/-2% oxygen):
    - All works will be suspended
    - The worksite will be evacuated
    - An investigation carried out to identify the source of the change
    - Corrective actions implemented to return the worksite to a safe condition; and
    - Work will not recommence until the worksite is gas tested and confirmed to be within safe limits for hazardous vapours

Continuous monitoring is the:

- Placement of gas detector at a worksite (including within a confined space during entry); while
- Specified work is performed; to allow
- Continuous monitoring for hazardous vapors

Continuous monitoring is required when:

- Personnel are required to wear supplied air respiratory protection in a confined space
- Hot work is taking place in:
  - A confined space; and/or
  - A 'Classified Hazardous Area' (i.e., DSEAR)
- Identified in the RAMS and/or PTW

Continuous monitoring requires the:

- Gas detector to be positioned by the Authorised Person
- Job crew and other affected personnel to be advised of the action to be taken if the gas detector goes into alarm mode
- Periodic readings to be recorded (e.g., designated report form or Permit To Work)
- The Authorised Person to:
  - Attend the work site periodically during the work; and
  - Confirm:
    - Correct functioning of the gas detector; and
    - That conditions have not changed

Note: *Continuous monitoring of a job site will not be used during work activities that involve high pressure water jetting, grit blasting or steam cleaning as these activities may affect the accuracy of the gas detector.*