



Government of **Western Australia**  
Department of **Commerce**  
*EnergySafety*

# Guidelines for Basic Combustion and Flue Gas/Exhaust Principles

Issued by:  
*EnergySafety*  
May 2011

## Recognition of training

It is EnergySafety policy that, where available, training be in accordance with national competencies.

To obtain recognition of the training package or course by the Director of Energy Safety for licensing purposes, a trainer needs to provide a written submission, detailing the training to be provided, to the Director of Energy Safety for consideration and endorsement.

Without the endorsement of the Director of Energy Safety, training packages or course will not be adequate for the issuing of a licence.

The submission must:

- Identify the training package/course outline and which class of gasfitting the training is intended to cover.
- List the competency units the training will cover. This list must be consistent with the EnergySafety licensing requirements and any agreements between EnergySafety and the Training Authority.
- Identify where the training topics and essential requirements listed in the guidelines will be covered in the training. Provide competency to equated requirement mapping.
- Identify the qualifications of the presenter and technical ability to deliver the training.
- Provide a list of training resources which will be used by trainees to obtain each of the gas competencies.
- Provide assessments - theory and practical; how will the student be assessed both theoretically and in the workplace or through workplace simulation. For written theory assessments supply papers with answers. Provide, where applicable, a copy of the quality delivery and assessment strategy (QDAS) document and assessment flow chart.
- Provide a reporting process (documentation that will be given at the end of the training package/course) which will state the competencies attained and the class/type of licence for which a trainee can apply. EnergySafety has recommended proformas.

For a training package/course designed to obtain a licence, a co-examiner acceptable to EnergySafety may need to be nominated to review the assessment of the trainee. This would normally take place after the Director of Energy Safety has endorsed the training.

EnergySafety reserves the right to review the delivery of training at any stage and accept or reject a qualification issued by an EnergySafety recognised training provider.

## **National Competencies**

National competencies, where available, must be used as part of a training package, but they will need to include, or be supplemented to include, all the listed applicable Training Subjects.

## **Minimum literacy and numeracy requirements**

For public safety and to ensure gas fitters can meet the technical standards required minimum literacy and numeracy standards must be met before a person can be deemed competent to carryout gasfitting work. Once the training provider issues the student with the agreed document identified in the training recognition process the student may be issued with a gasfitting permit. The applicant for a gasfitting permit or authorisation must have sufficient literacy and numeracy skills so that they are, in the workplace, able to independently:

- (a) read, interpret and apply regulations, industry codes, standards, and manufacturers' installation instructions;
- (b) duly complete the administration requirements of the Regulations. This includes, but is not limited to Notices of Completion and compliance badges; and
- (c) correctly calculate ventilation requirements, correctly size flueing, correctly size piping systems, and correctly plan a gas installation.

Reasonable adjustments may be made to the assessment process to meet the needs of individual applicants, but shall not reduce the minimum requirements set out in this guideline.

## **Assessment**

Each trainee will be required to demonstrate to the trainer/assessor that they have achieved adequate knowledge in combustion, fluing and exhaust principals.

### **Assessment methodology**

The assessment of adequate knowledge in combustion, fluing and exhaust principals is established in a number of ways; verbal or written questions and answers. As a minimum, the trainee must demonstrate a fundamental understanding of combustion, fluing and exhaust principles. The trainee must be able to demonstrate the ability to differentiate between safe and unsafe combustion parameters. The trainee must demonstrate how an understanding of combustion, fluing and exhaust principals applies in the workplace.

# Introduction to the Requirements for Gasfitting and Consumers' Gas Installations

The following basic combustion and flue gas/exhaust principles module is one of three pre-requisites for obtaining a WA gasfitting permit or authorisation. This training will have to be completed before undertaking further training to obtain a specific class of gasfitting.

## **“Basic Combustion and Flue Gas/Exhaust Principles”**

### **Training Subjects:**

- Western Australian retailed fuel gases.
  - History and source of natural and liquefied petroleum gases in WA.
- Physical properties of retailed fuel gases.
  - Natural Gas (NG).
  - Liquefied Petroleum Gas (LP Gas).
  - Simulated Natural Gas (SNG).
- Basic combustion.
  - How complete and incomplete combustion occurs:
    - Chemically.
    - Physically.
  - Hazards associated with:
    - complete combustion;
    - incomplete combustion.
- Exhaust gas.
  - Constituents.
  - Hazards.
- Principles of flue and exhaust systems.
  - Atmospheric.
  - Forced.
  - Induced.

## Information

EnergySafety reserves the right to reject any training package/course that it considers as not meeting an acceptable licensing outcome.

For further information, contact the Principal Engineer Gas Utilisation.

Postal: EnergySafety WA  
PO Box 135  
Cannington WA 6987

Office: 303 Sevenoaks Street  
Cannington  
Phone: (08) 9422 5200  
Fax: (08) 9422 5244

Website: [www.energysafety.wa.gov.au](http://www.energysafety.wa.gov.au)

The information in this document is provided for guidance only.  
The delivery of any training based on information in this document does not, without prior agreement, mean recognition by EnergySafety.

© **Copyright laws apply**