

## Demonstrate knowledge of energy efficiency and conservation relevant to plumbing and gasfitting

**Level** 2

**Credits** 6

**Purpose** This unit standard is for candidates that are intending to work in the plumbing, gasfitting and drainlaying trade. Competence is at an overview level, indicating knowledge of the options and efficiency of alternative system types.

People credited with this unit standard are able to: describe methods of determining efficiency of appliances relevant to plumbing and gasfitting; identify energy efficient space heating installations; identify energy efficient domestic water heating installations; identify domestic rainwater harvesting systems; and identify and describe treatment and conservation options for the disposal of domestic wastewater.

**Subfield** Plumbing, Gasfitting and Drainlaying

**Domain** Core Plumbing, Gasfitting, and Drainlaying

**Status** Registered

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**Entry information** Open.

**Accreditation** Evaluation of documentation by NZQA.

**Standard setting body (SSB)** The Skills Organisation

**Accreditation and Moderation Action Plan (AMAP) reference** 0008

This AMAP can be accessed at <http://www.nzqa.govt.nz/framework/search/index.do>.

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### Special notes

- 1 The New Zealand Building Code (NZBC) is a schedule to the Building Regulations 1992. It provides requirements for compliance with the Building Act 2004 when constructing a new building or altering an existing one. The NZBC sets out performance standards that building work must meet, and covers aspects such as structural stability, fire safety, access, moisture control, durability, services and facilities.

## 2 References

- NZS 4305:1996 *Energy efficiency – Domestic type hot water systems*.
- AS/NZS 6400:2005 *Water efficient products – Rating and labelling*.
- Information relating to efficiency of systems and appliances may be found at the
- Energy Efficiency and Conservation Authority website – <http://www.eeca.govt.nz>.
- ENERGY STAR and New Zealand minimum energy performance (MEPS) information may be found at <http://www.energystar.govt.nz/>.
- Australian energy rating information (MEPS) – <http://www.energyrating.gov.au>.
- Australian water rating information (WELS scheme) may be found at – <http://www.waterrating.gov.au>.

3 Energy performance standards and legislation are under constant review. It is recommended that assessors, trainers and resource developers check the New Zealand and Australian Government websites for plumbing and gasfitting appliance energy program status updates.

## 4 Definitions

*Coefficient of performance (COP)* – measure of heating appliance efficiency determined by dividing the heating output by the power input.

*Hydronic space heating* – system where fluid (often water) is circulated through radiators or concrete slabs to heat the occupants in a building.

*Space heating* – heating system that heats the air or occupants in a building.

*Industry practice* – sound industry practice that meets legislative requirements.

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## Elements and performance criteria

### Element 1

Describe methods for determining efficiency of appliances relevant to plumbing and gasfitting.

### Performance criteria

1.1 Description includes a comparison and examples of COP for water and space heating appliances.

Range gas, electricity, heat pump, solar.

1.2 Appliance efficiency measures are described in accordance with applicable Australasian standards.

Range may include but is not limited to – MEPS, WELS, AS/NZS 6400:2005;  
appliance measures include but are not limited to – water and space heater gas energy usage, appliance water usage.

## Element 2

Identify energy efficient space heating installations.

### Performance criteria

2.1 Gas space heating installations are described in terms of advantages, disadvantages, typical applications, layout, fitting requirements, and energy efficiency.

2.2 Hydronic space heating installations are described in terms of advantages, disadvantages, typical applications, layout, plumbing and gasfitting requirements, and energy efficiency.

Range includes but is not limited to – radiator and underfloor system layout, solar, heat pump, gas water heating.

2.3 Solar space heating installations are described in terms of advantages and disadvantages compared to other heating options.

Range includes but is not limited to – passive and active systems.

2.4 Alternative space heating options that are installed by other trades are described in terms of their energy efficiency.

## Element 3

Identify energy efficient domestic water heating installations.

Range includes but is not limited to – solar, heat pump, gas water, gas boosted systems.

### Performance criteria

3.1 Advantages and disadvantages of different systems are identified in terms of energy efficiency.

Range includes comparison with electric systems.

3.2 Advantages and disadvantages of different systems are identified in terms of installation complexity and cost.

3.3 Typical layout of system components and energy efficiency considerations are identified in accordance with industry practice.

## Element 4

Identify domestic rainwater harvesting systems.

### Performance criteria

- 4.1 Domestic rainwater harvesting systems are identified in terms of sustainability advantages.
- 4.2 The components of a domestic rainwater harvesting system are identified in accordance with industry practice.
- 4.3 The plumbing requirements of a rainwater harvesting system are identified in accordance with industry practice.
- 4.4 Regulatory requirements for installing rainwater harvesting systems are identified in accordance with the NZBC.

## Element 5

Identify and describe treatment and conservation options for the disposal of domestic wastewater.

### Performance criteria

- 5.1 Grey water treatment and disposal options are identified and described in accordance with the NZBC.
- 5.2 Black water treatment and disposal options are identified and described in accordance with the NZBC.

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### Please note

Providers must be accredited by NZQA, or an inter-institutional body with delegated authority for quality assurance, before they can report credits from assessment against unit standards or deliver courses of study leading to that assessment.

Industry Training Organisations must be accredited by NZQA before they can register credits from assessment against unit standards.

Accredited providers and Industry Training Organisations assessing against unit standards must engage with the moderation system that applies to those standards.

Accreditation requirements and an outline of the moderation system that applies to this standard are outlined in the Accreditation and Moderation Action Plan (AMAP). The AMAP also includes useful information about special requirements for organisations wishing to develop education and training programmes, such as minimum qualifications for tutors and assessors, and special resource requirements.

### **Comments on this unit standard**

Please contact The Skills Organisation [info@skills.org.nz](mailto:info@skills.org.nz) if you wish to suggest changes to the content of this unit standard.