

REGULATED QUALIFICATION FRAMEWORK (RQF)

QUALIFICATION SPECIFICATION

LCL Awards Level 3 Award in Low Temperature Heating and Hot Water Systems in Dwellings

1.0 Qualification Objectives

The objectives of the qualification are to:

1. Prepare learners to progress to a qualification in the same subject area but at a higher level or requiring more specific knowledge, skills and understanding
2. Prepare learners to progress to a qualification in another subject area.

2.0 Prior qualifications, knowledge, skill or understanding which learners are required to have achieved before taking the qualification.

None.

An Initial Assessment conducted by the Approved Centre on application for the qualification will determine the learner's capability to complete the qualification.

3.0 Other requirements which a learner must have satisfied before the learner will be assessed or before the qualification will be awarded.

None.

4.0 Qualification Framework

The qualification comprises of one mandatory unit which must be satisfactorily completed by learners.

Unit Title	Unit Reference Number	Type of Unit	Level	Credit Value
Low Temperature Heating Systems	LCL-P3002	Knowledge	3	2

4.1 Qualification Time and Credit Value:

- Total Qualification Time (TQT) is 20 hours
- The Guided Learning Hours (GLH) are 16
- The total credit value of the qualification is 2.

4.2 Qualification Level

The qualification has been assigned at level 3.

4.3 Grading Structure

The grading structure for the qualification is that learners are required to achieve a result of **Pass** to be awarded credit for the unit.

This qualification will be achieved when learners have successfully completed:

- The LCL Awards set and marked online multiple choice knowledge examination.

4.4 Assessment Method

The assessment method within the qualification is an online multiple choice knowledge examination.

The assessment method has been designed to assess the knowledge of learners.

5.0 The criteria against which learners' level of attainment will be measured

The Learning Outcomes and Assessment Criteria against which learners' level of attainment will be measured are detailed the criteria below.

Unit Learning Outcomes and Assessment Criteria

LCL-P3002: Low Temperature Heating Systems

Learning Outcome 01. The learner will know the latest industry standards and regulatory framework relating to heating design.

The learner will demonstrate knowledge of:

- 1.1 The standards and regulations that are applicable to heating and hot water system design
- 1.2 The responsibility and duty of the installer to correctly specify, design, install and commission an energy efficient low carbon hot water and heating system
- 1.3 Other opportunities for energy efficiency upgrades within a property and their impact on the heating system.

Learning Outcome 02. The learner will know the requirements for undertaking a room-by-room heat loss for a property.

The learner will demonstrate knowledge of:

- 2.1 Different building elements and structures
- 2.2 U values
- 2.3 Ventilation heat loss
- 2.4 Transmission heat loss
- 2.5 Calculating a room-by-room heat loss for a property.

Learning Outcome 03. The learner will know how to correctly size heat emitters for low temperature heating systems.

The learner will demonstrate knowledge of:

- 3.1 The effect on heat emitter size at varying flow and return temperatures
- 3.2 The variation in heat emitter heat output at various mean water temperatures with respect Δt
- 3.3 Response times and their effect on the heat generator/emitter size
- 3.4 The effect of different controls on the overall size of the heat generator/emitter
- 3.5 Consumers behaviour and its effect on heat generator/emitter sizing
- 3.6 The space limitations when sizing a low temperature heat emitter
- 3.7 The importance of system balancing and its benefits
- 3.8 How to advise the consumer on the benefits and limitations of a low water temperature heating system
- 3.9 Calculating the size of a heat emitter at various flow and return temperatures.

Learning Outcome 04. The learner will know how to correctly size pumps and pipework.

The learner will demonstrate knowledge of:

- 4.1 The relationship between pressure, flow and velocity
- 4.2 The relationship between heat, Δt and flow rates
- 4.3 The effect of different pipe diameters at different load conditions
- 4.4 The effect on system pressure loss in relation to:
 - Valves
 - Components
 - Pipework fittings.
- 4.5 How to interpret a pump curve
- 4.6 The duty point and how to correctly size a pump to meet the needs of the index circuit
- 4.7 The effects on pressure loss with different system Δt
- 4.8 The effect of high velocities on the system design
- 4.9 The overall impact of the system on the consumer when designing for different Δt
- 4.10 Expansion Vessel sizing
- 4.11 Calculating the size of the pipework and select the correct pump for a heating system.

Learning Outcome 05. The learner will know how to correctly size a domestic hot water system.

The learner will demonstrate knowledge of:

- 5.1 The difference between total water volume versus usable hot water volume
- 5.2 The effects on response times with varying heat generator sizes
- 5.3 How to design a hot water system for a consumer based upon their user profile, behaviour and needs
- 5.4 How to design a hot water system based upon the needs of the property
- 5.5 The importance of the location of the hot water storage system in relation to the heat generator
- 5.6 The effect of uninsulated Domestic Hot water (DHW) pipework on the overall system performance
- 5.7 The key factors needed to correctly size DHW pipework based upon the available dynamic pressure and flow within the property
- 5.8 Calculating the size of the DHW system to meet the needs of both the consumer and property itself
- 5.9 Ensuring the system meets water safety requirements for a Domestic Hot Water system.

Learning Outcome 06. The learner will know the basic design principles of system configurations.

The learner will demonstrate knowledge of:

- 6.1 Different design configurations utilising zone valves
- 6.2 Different design configurations between radiator and underfloor heat emitters
- 6.3 Basic principles of hydraulic separation.

6.0 Other Information

Qualification Regulator Number:

- Ofqual QAN 603/7761/6

Sector Skills Area (SSA): 5.2 Building and Construction.

Age suitability: 16+

Last Qualification Review Date: October 2024

Next Qualification Review Date: October 2027