
REGULATED QUALIFICATION FRAMEWORK (RQF)

QUALIFICATION SPECIFICATION

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

Learning Outcome 01. The learner will understand 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 (including but not limited to Domestic Heating Compliance Guide)
- 1.2 the responsibility and duty of the installer to correctly specify, design, install and commission an energy efficient hot water and heating system to ensure low carbon operation
- 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 calculation 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 identify and understand the different heat emitter technologies and their suitability
- 3.2 the effect on heat emitter output and size at varying flow and return temperatures and flow rates
- 3.3 the importance of system balancing and its benefits and the different methods for achieving a balanced system
- 3.4 how to advise the consumer on the benefits and limitations of a low water temperature heating system
- 3.5 response times and their effect on the heat generator/emitter size
- 3.6 the effect of different controls on the overall size of the heat generator/emitter
- 3.7 consumer and building behaviour and its effect on heat generator/emitter sizing

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

The learner will demonstrate knowledge of:

- 1.1 the relationship between pressure, flow and velocity
- 1.2 the relationship between heat, Δt and flow rates
- 1.3 the effect of different pipe diameters at different load conditions
- 1.4 how to interpret a pump curve
- 1.5 the duty point and how to correctly size a pump to meet the needs of the index circuit
- 1.6 how to correctly size and position expansion vessels in heating systems
- 1.7 the effect of using additional accessories in heating systems and their effect on pressure loss and flow rate
- 1.8 the effects on pressure loss with different system Δt
- 1.9 the effect of high velocities on the system design
- 1.10 the overall impact of the system on the consumer when designing for different Δt
- 1.11 calculating the size of the pipework and selecting the correct pump for a heating system
- 1.12 system controls and the principles of setting a system to work

Learning Outcome 05. The learner will know how to correctly size a domestic hot water storage 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 storage system for a consumer based upon their user profile, behaviour and needs
- 5.4 how to design a hot water storage system based upon the needs of the property
- 5.5 importance of the location of the hot water storage system in relation to the heat generator
- 5.6 the effect of uninsulated 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 storage system to meet the needs of both the consumer and property itself

Learning Outcome 06. The learner will understand the key design principles of system configurations

The learner will demonstrate knowledge of:

- 6.1 Different design configurations utilising relevant controls, zones and heating circuits
- 6.2 Different design configurations between radiator and underfloor heat emitters
- 6.3 principles of hydraulic separation
- 6.4 How to design and apply system schematics for low temperature heating systems with hot water

National Occupational Standard:

Prior qualifications, knowledge, skill or understanding which the learner is required to have before taking this qualification. (Pre-requisites)

- N/SVQ Level 2/3 in Plumbing or equivalent earlier certification that provides evidence of competence;
- or
- N/SVQ Level 2/3 in Heating and Ventilating (Domestic Installation) or equivalent earlier certification that provides evidence of competence;
- or
- N/SVQ Level 2/3 in Heating and Ventilating (Industrial and Commercial Installation) or equivalent earlier certification that provides evidence of competence;
- or
- N/SVQ Level 2/3 in Oil-Fired Technical Services or equivalent earlier certification that provides evidence of competence;
- or
- N/SVQ Level 2/3 in Gas Installation and Maintenance or equivalent earlier certification that provides evidence of competence;
- or
- heating installers with minimum 3 years of experience installing wet central heating systems, evidenced either by manufacturer courses certification or Gas Safe Register, OFTEC, MCS or HETAS registration