
Overview

This standard is for people who install and test industrial and commercial heating and ventilating pipework systems.

The person performing this work must be able to comply with the correct procedures and practices for installing and testing industrial and commercial heating and ventilating pipework systems. This work must be in accordance with the current versions of the appropriate industry standards and regulations; the specification; industry recognised working practices; the working environment and the natural environment. They must know and understand the methods, procedures and techniques for fitting, fixing and connecting components and accessories, including welding, and the pipework requirements of the following systems:

- hot water
- hot water heating
- cold water
- chilled water
- compressed air
- fire protection
- steam

Performance criteria

You must be able to:

1. verify that the job information and documentation are current and relevant and that the plant, instruments, access equipment and tools are fit for purpose
2. confirm that the site services are compatible with the system's design
3. produce a risk assessment and method statement in accordance with organisational procedures for the work to be carried out, including the identification and use of personal protective equipment
4. confirm before work starts that the work location and work area can be accessed safely and has been checked for the risk to other personnel on the site, and take appropriate action if a risk is present
5. select the equipment, components and accessories to be installed ensuring they are:
 - of the right type and size
 - fit-for-purpose
 - in accordance with the system's design
 - suitable for the working environment in which they are to be installed
6. determine at the outset, that the plans for positioning and fixing equipment, components and accessories are in accordance with:
 - the system's design
 - the working environment
 - manufacturer instructions
7. comply with industry practices and organisational procedures to ensure the co-ordination of site services and the activities of other trades
8. measure and mark out locations for fitting and fixing the selected equipment, components and accessories in accordance with:
 - the system's design

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- manufacturer instructions
9. prepare, fit, fix and connect the selected pipework and equipment, components and accessories using suitable jointing methods in accordance with:
 - the system's design
 - the working environment
 - manufacturer instructions
 - when required, appropriate welding techniques
 10. adjust, as appropriate, safety and control features of the system
 11. carry out cleaning and flushing of the system
 12. confirm the integrity of the installed system using appropriate testing
 13. confirm with the relevant people:
 - those necessary variations to the planned programme of work
 - the correct actions to be taken to ensure that any variations to the planned programme of work will minimise the potential for hazard and risk
 14. implement organisational procedures for the safe transport and/or disposal of waste material, substances and liquids in accordance with suppliers' and manufacturers' instructions

Knowledge and understanding

You need to know and understand:

1. the operation, applications, advantages and limitations of different systems
2. the applications, advantages and limitations of system equipment, components and accessories in relation to the working environment
3. the appropriate industry standards and regulations relevant to installing and testing the systems
4. how to verify that job information and documentation is current and relevant and that the plant, instruments, access equipment and tools are fit for purpose
5. how to produce a risk assessment and method statement for the work to be carried out, including the identification and use of personal protective equipment, in accordance with:
 - the system's design
 - the conditions of the working environment
 - organisational procedures
 - activities of other personnel on site
6. the methods for determining the type and size of equipment, components and accessories for the system
7. how to interpret diagrams and drawings of the system to:
 - locate site services
 - identify the planned location of the system's, equipment, components and accessories
8. the organisational procedures for confirming, before work starts, that the work location and work area can be accessed safely and has been checked for the risk to other personnel on the site, and for taking appropriate action if a risk is present
9. the methods, techniques and jointing methods for fitting, fixing and connecting the selected equipment, components and accessories in accordance with:

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- the system's design
 - the working environment
 - manufacturer instructions
 - when required, appropriate welding techniques
10. the appropriate testing procedures for confirming the system's integrity
 11. the methods and techniques for adjusting safety and control features
 12. the methods and techniques for cleaning and flushing the system
 13. the organisational procedures for confirming with the relevant people the appropriate actions to be taken to ensure that any variations to the planned programme of work will not introduce a hazard and have minimum negative impact on the installation work to be undertaken
 14. how to implement organisational procedures for the safe transport and/or disposal of any waste material, substances and liquids in accordance with suppliers' and manufacturers' instructions

Scope/range related to performance criteria

Working Environment (Internal and/or External)

- commercial
- industrial
 - agricultural
 - horticultural
 - leisure and entertainment
 - residential medical and care facilities
 - public services establishments
 - pre-1919 traditional/historic buildings

Site services

- electricity
- water
- gas
- oil

Systems

Industrial and commercial heating and ventilating pipework

- hot water – open vented/indirect/secondary circulation/instantaneous
- hot water heating (low, medium and high temperature)
- cold water – storage/none storage
- * *chilled water systems – air conditioning, refrigeration, heat rejection
- compressed air
- fire protection
- steam

Equipment, components and accessories

- fuel-fired boilers (gas; oil; solid fuel)
- hot water storage vessels
- water heaters
- pumps
- heat emitters
- heat exchangers
- burners
- flues
- cisterns
- refrigeration plant
- air conditioning plant
- calorifiers
- valves (including motorised)
- compressors
- receivers
- filters
- pressure vessels
- sprinkler heads
- traps and strainers
- measuring instruments
- environmental technology equipment
- prefabricated modules
- supports and fixings* *

Organisational Procedures

- information management
- project management
- risk assessment management
- implementing and monitoring health & safety requirements and issues
- implementing and monitoring issues relating to the natural environment
- customer service
- accident reporting
- emergencies
- communication with relevant people

Welding

- manual arc welding
- oxy-acetylene welding
- tungsten inert welding

Plant

- generators
- transformers for low voltage hand-tools
- lifting equipment
- access equipment

Site

- new build construction – building or structure
- existing building or structure

Relevant people

- customers/clients
- client representatives
- supervisors

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- site/contract manager
 - other contractors/trades
 - members of the public
 - work colleagues

Appropriate testing

- pressure
- system hygiene and charging
- performance

Joining methods

- welding
- threaded
- grooved
- flanges
- compression
- adhesives

BSEHV04

Install and test industrial and commercial heating and ventilating pipework systems



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