



## F9NP 04 – Prepare and Undertake Specialist Pipe Jointing Methods and Proprietary Installation Systems

This Unit comprises of the following combinations of National Occupational Standards (NOS) shown below by award it appears in.

# SUMMES21

## Install industrial and commercial heating & ventilating systems, equipment and components



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### Overview

This unit is about installing heating systems and components and involves conducting the appropriate soundness testing of systems and components, and the appropriate specified testing procedures during or after the installation of components.

The person carrying out the work must understand how various components relate to each other within the systems being installed.

# SUMMES21

## Install industrial and commercial heating & ventilating systems, equipment and components

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### Performance criteria

- You must be able to:*
- P1 confirm that the customer is aware that job information on all key aspects of the installation process is available
  - P2 confirm that all materials, tools and equipment necessary for the installation process will be available as required
  - P3 arrange safe storage provision for materials, tools and equipment, which meet industry requirements
  - P4 confirm that all preparatory work to meet the installation requirements of systems and components has been carried out
  - P5 confirm that the materials, tools and equipment required for the installation processes are fit for their intended purpose
  - P6 assemble system components using work methods that conform to industry requirements
  - P7 position system components to conform to the system design requirement
  - P8 fix system components using methods that conform to industry requirements
  - P9 connect system components to systems and input service connections using methods that meet industry requirements
  - P10 carry out the installation processes in line with industry requirements, minimising damage to customer property and building features
  - P11 report to the immediate job supervisor, line manager or customer in accordance with industry requirements any circumstances that affect the progress of the installation
  - P12 confirm the integrity of the installed system using specified testing procedures
  - P13 take precautionary actions to prevent the unauthorised use of un-commissioned systems and components

# SUMMES21

## Install industrial and commercial heating & ventilating systems, equipment and components

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### Knowledge and understanding

*You need to know and understand:*

- K1 how to measure and record site details for installation purposes
- K2 the industry practices and work standards for installing system components
- K3 the positioning and fixing requirements for system components which conform to the system design and intended functions
- K4 the procedures required for connecting to input services or connecting into existing systems
- K5 methods of working which protect the building fabric, customer property and existing systems or components
- K6 job management structures and methods of reporting and recording job progress or problems delaying progress
- K7 the care and maintenance requirements of tools and equipment, and the checks required to confirm they are in a safe condition
- K8 the range of tests used to confirm the soundness of systems and components and how to use the range of specified testing procedures
- K9 what precautionary actions are required during installation and testing

# SUMMES21

Install industrial and commercial heating & ventilating systems, equipment and components

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**Developed by** SummitSkills

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**Originating organisation** SummitSkills

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**Original URN** M21

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**Relevant occupations** Building and construction; Skilled Trades Occupations

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**Suite** Mechanical Engineering Services

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**Key words** Install, component test procedure

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## SUMMES25

### Inspect and test mechanical systems, equipment and components



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#### Overview

This unit is about carrying out pre-commissioning checks and tests on systems.

The person carrying out the work must be able to undertake the various checks and tests necessary before the system is brought into operation.

They are required to check the operation and correct position of components. They must also carry out tests to ensure there are no leaks and undertake cleaning or flushing of the system.

In the case of ductwork, there is a specified, permissible level of air leakage.

It is important that they are aware of the effect that isolating part of a system has on the full system.

# SUMMES25

## Inspect and test mechanical systems, equipment and components

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### Performance criteria

- You must be able to:*
- P1 confirm that the system or components installation complies with industry requirements
  - P2 check that input services to the system components are suited to their intended purpose
  - P3 check system or components for soundness using procedures that comply with industry
  - P4 carry out pre-commissioning tests and checks in accordance with industry requirements
  - P5 check that the system cleanliness, additives and charging comply with industry

# SUMMES25

## Inspect and test mechanical systems, equipment and components

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### Knowledge and understanding

*You need to know and understand:*

- K1 the procedures, equipment and legislative requirements for applying specified tests to systems
- K2 the methods of establishing that input services adequately supply all components within the system
- K3 the methods of connecting components to systems
- K4 the actions to take where pre-commissioning checks or tests reveal basic or complex system or component defects
- K5 how to complete pre-commissioning documentation confirming the safe pre-commissioning of systems and components



## SUMMES25

Inspect and test mechanical systems, equipment and components

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**Relevant occupations** Building and construction; Skilled Trades Occupations

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**Suite** Mechanical Engineering Services

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**Key words** pre-commissioning check, clean & flush, leaks

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### Overview

This unit is about commission systems following the appropriate pre-commissioning tests and checks being carried out.

It is about bringing the system into operation and ensuring it operates effectively as intended.

The person carrying out this work is required to check that components are installed correctly, ensure there are no leaks and undertake cleaning and flushing.

For ductwork there is a specified permissible level of air leakage. It is not intended that they meet the demands of commissioning specialists. As a guide, they should be able to operate on heating systems with an input of up to 60kW for domestic installation and 150kW for industrial and commercial.

It is important that they are aware of the effect that isolating part of a system has on the full system.

# SUMMES27

## Commission mechanical systems

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### Performance criteria

*You must be able to:*

- P1 ensure that the necessary information on the system or component performance is available
- P2 liaise with other persons at appropriate points within the commissioning process to minimise disturbance to work routines
- P3 check the correct function of systems or components against performance requirements
- P4 adjust system controls to establish that system components meet design specification
- P5 provide the customer with information necessary to the continuing operation of the system or component

# SUMMES27

## Commission mechanical systems

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### Knowledge and understanding

*You need to know and understand:*

- K1 the sources of information on the performance of systems or components
- K2 the procedures for establishing correct system or component performance and checking against the job specification
- K3 the routines and sequences for commissioning systems or components
- K4 the points in the commissioning process where co-operation and liaison with other trades and customers may be required
- K5 where to access user information appropriate to different systems and components
- K6 how to complete commissioning documentation confirming the safe commissioning of systems and components
- K7 system handover procedures and demonstrating the operation of systems and components to end-users
- K8 the actions to take when components being commissioned do not meet performance requirements

# SUMMES27

## Commission mechanical systems

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**Suite** Mechanical Engineering Services

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**Key words** commission, test, clean & flush

## EUSDSG3.47

### Prepare resources for pipe jointing activities



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#### Overview

This involves being able to prepare work areas, materials and equipment to undertake pipe jointing. It involved ensuring that others using the work area are safe and aware of possible disruption, and that the work area is properly protected.

The person carrying out this work must ensure that the equipment they are using is appropriate to the job, in correct operating order and set up correctly to carry out the required work.

Preparation of materials includes jointing consumables and pipework. This unit is applicable to those preparing and aligning joints using cutting, expanding, flaring, hydraulic, compression and abrasive techniques, and propane, butane, oxy-acetylene and/or high temperature gas flame.

Note: This national occupational standard (Ref ID M30) belongs to SummitSkills – the Sector Skills Council for the Building Services Engineering Sector.

## **EUSDSG3.47**

### **Prepare resources for pipe jointing activities**

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#### **Performance criteria**

*You must be able to:*

- P1 work safely at all times, complying with health and safety and other relevant regulations and guidelines
- P2 ensure that the work environment is suitable for the work activities to be undertaken
- P3 obtain all the required equipment and materials and ensure that they are suitably prepared for the activities to be carried out
- P4 in line with work requirements, prepare the work area for the storage of materials and finished products
- P5 ensure that all necessary service supplies are connected and ready for use
- P6 make sure that required safety arrangements are in place to protect other workers from activities likely to disrupt normal working
- P7 inform the appropriate people when preparations are completed
- P8 deal promptly and effectively with problems within their control and report those that cannot be solved
- P9 report completion of preparations in-line with organisational procedures

## **EUSDSG3.47**

### **Prepare resources for pipe jointing activities**

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#### **Knowledge and understanding**

*You need to know and understand:*

- K1 health and safety legislation, regulations and safe working practices and procedures
- K2 work area preparation requirements and methods
- K3 types of equipment necessary to undertake jointing activities safely
- K4 how to identify necessary materials and recognise defects
- K5 safe materials handling and preparation methods and techniques
- K6 tools and equipment care and control procedures
- K7 organisational reporting lines and procedures



## **EUSDSG3.47**

### Prepare resources for pipe jointing activities

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**Relevant occupations** Engineering; Science and Engineering Technicians

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**Suite** Down Stream Gas

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**Key words** prepare, resources, pipe, pipes, jointing

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### Overview

This unit is applicable to those that join pipework by brazing, soldering, welding or mechanical means to meet specifications and establish compliance with pipework jointing specifications.

The person carrying out this work is required to undertake the jointing process for different types of joints, in various positions and to conduct visual inspections and checks of the completed work.

The activities involved include connecting pipework joints using cutting, expanding, flaring, hydraulic, compression and abrasive techniques, and propane, butane, oxy-acetylene and/or high temperature gas flame.

# SUMMES31

## Connect pipework

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### Performance criteria

*You must be able to:*

- P1 work safely at all times, complying with health and safety and other relevant regulations and guidelines
- P2 follow the relevant joining procedures and job instructions for completion and checking of work
- P3 check that the joint preparation complies with the specification
- P4 check that joining and related equipment and consumables are as specified and fit for the purpose
- P5 make the joints as specified using the appropriate joining technique
- P6 produce joints of the required quality and of specified dimensional accuracy
- P7 where appropriate, shut down the equipment to a safe condition on completion of joining activities
- P8 in line with approved and agreed procedures, deal promptly with excess and waste materials and temporary attachments
- P9 deal promptly and effectively with problems within their control and report those that cannot be solved
- P10 use all the correct tools and inspection equipment and check that they are in useable condition
- P11 carry out checks on completed work in an appropriate sequence using approved methods and procedures
- P12 identify and assess any defects or variations from the specification and take appropriate action
- P13 report completion of compliance activities in line with organisational procedures

# SUMMES31

## Connect pipework

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### Knowledge and understanding

*You need to know and understand:*

- K1 health and safety legislation, regulations, safe working practices and procedures relevant to the work being carried out
- K2 jointing specifications and joining procedures for the work being carried out
- K3 how to interpret engineering drawings and related specifications
- K4 jointing processes and equipment relevant to the specification
- K5 safe material handling, preparation, finishing methods and techniques
- K6 appropriate materials and their joining characteristics
- K7 setting, operating and care procedures for the equipment being used
- K8 appropriate personal approval tests and how to conduct them safely
- K9 hazards arising from joining operations
- K10 appropriate compliance checking methods and techniques
- K11 how to identify defects in products and assets
- K12 organisational reporting lines and procedures
- K13 organisational and regulatory quality control systems and documentation procedures
- K14 inspection equipment care and control procedures

# SUMMES31

## Connect pipework

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**Relevant occupations** Building and construction; Skilled Trades Occupations

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**Suite** Mechanical Engineering Services

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