



National Unit specification: general information

Unit title: Painting and Decorating: Airspraying and High Volume Low Pressure (HVLP) (SCQF level 6)

Unit code: H0HF 12

Superclass: TG

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Summary

This Unit is suitable for candidates working towards a Modern Apprenticeship in Painting and Decorating and will develop the candidate's craft skills in air spraying techniques. The Unit is designed to provide candidates with the competences to select, set up and use various types of compressors, HVLP turbines, spray guns, feed systems and containers used in air spraying. The candidates will also be able to transfer these skills to the workplace. Problem solving will be an endemic part of the Unit as candidates learn to troubleshoot (diagnose and prescribe remedies) for, setting up, equipment and application faults.

Outcomes

- 1 Demonstrate knowledge and understanding of the working principles of various types of Air Compressing Outfits (ACOs) and High Volume Low Pressure (HVLP) turbines used in air spraying.
- 2 Explain the working principles of the different feed systems used in air spraying.
- 3 Describe the function of various types of spray guns and their containers and their component parts used in air spraying.
- 4 Diagnose and describe remedial action for setting up faults, equipment faults and application faults which can occur in air spraying.
- 5 Set up, use, clean, dismantle and store compressors, HVLP turbines, spray guns and containers to apply paint by the air spray method.

Recommended entry

While entry is at the discretion of the centre candidates will be required to be employed in the relevant craft industry and undertaking the Professional Development Award in Painting and Decorating at SCQF level 6 and meet the requirements of the Modern Apprenticeship.

General information (cont)

Unit title: Painting and Decorating: Airspraying and High Volume Low Pressure (HVLP) (SCQF level 6)

Credit points and level

2 National Unit credits at SCQF level 6: (12 SCQF credit points at SCQF level 6*)

**SCQF credit points are used to allocate credit to qualifications in the Scottish Credit and Qualifications Framework (SCQF). Each qualification in the Framework is allocated a number of SCQF credit points at an SCQF level. There are 12 SCQF levels, ranging from Access 1 to Doctorates.*

Core Skills

Achievement of this Unit gives automatic certification of the following:

Complete Core Skill	None
Core Skill component	Critical Thinking @ SCQF level 5

There are also opportunities to develop aspects of Core Skills which are highlighted in the Support Notes of this Unit Specification.

National Unit specification: statement of standards

Unit title: Painting and Decorating: Airspraying and High Volume Low Pressure (HVLP) (SCQF level 6)

Acceptable performance in this Unit will be the satisfactory achievement of the standards set out in this part of the Unit specification. All sections of the statement of standards are mandatory and cannot be altered without reference to SQA.

Outcome 1

Demonstrate knowledge and understanding of the working principles of various types of Air Compressing Outfits (ACOs) and High Volume Low Pressure (HVLP) turbines used in air spraying.

Performance Criteria

- (a) Explain the basic working principles of piston driven, rotary, diaphragm compressors and HVLP turbine.
- (b) Identify and state the function of the component parts of high pressure compressors.
- (c) Describe factors which influence choice of ACOs for particular air spray tasks.
- (d) Describe the factors which affect pressure drop.

Outcome 2

Explain the working principles of the different feed systems used in air spraying.

Performance Criteria

- (a) Describe the working principles of gravity feed, suction feed and pressure fed systems.
- (b) Identify gravity, suction and pressure feed systems.
- (c) Identify air and fluid hoses.

Outcome 3

Describe the function of various types of spray guns and their containers and their component parts used in air spraying.

Performance Criteria

- (a) Explain the working principles and the advantages of HVLP guns.
- (b) Identify and describe the function of component parts of non-bleeder guns.
- (c) Identify bleeder gun.
- (d) Identify pressure fed containers and describe the function of their component parts.
- (e) List the advantages and disadvantages of external and internal air caps.
- (f) Explain the reasons for an air cap test.

National Unit specification: statement of standards (cont)

Unit title: Painting and Decorating: Airspraying and High Volume Low Pressure (HVLP) (SCQF level 6)

Outcome 4

Diagnose and describe remedial action for setting up faults, equipment faults and application faults which can occur in air spraying.

Performance Criteria

- (a) Describe critical factors in setting up spray guns for use.
- (b) Explain the causes of, and remedies for, application faults.
- (c) Explain the causes of, and remedies for, setting up faults.
- (d) Explain the causes of, and remedies for, equipment faults.

Outcome 5

Set up, use, clean, dismantle and store compressors, HVLP turbines, spray guns and containers to apply paint by the air spray method.

Performance Criteria

- (a) Select and prepare materials for application by air spray.
- (b) Mask/de-mask all appropriate areas prior to and after spraying.
- (c) Set up, use, dismantle, clean and store compressed air and HVLP equipment.
- (d) Set up, use, dismantle, clean and store gravity, suction and pressure fed spray guns, HVLP spray guns and their containers.
- (e) Apply coatings by air spray to the given specification and standards.
- (f) Comply with current health and safety requirements during all work methods and activities.

National Unit specification: statement of standards (cont)

Unit title: Painting and Decorating: Airspraying and High Volume Low Pressure (HVLP)

Evidence Requirements for this Unit

Evidence is required to demonstrate that candidates have achieved all Outcomes and Performance Criteria.

These Evidence Requirements will be met by the completion of the Painting and Decorating Training and Assessment Programme (TAP).

Evidence is required to demonstrate that the candidate has achieved this Unit to the standard specified in all Outcomes and Performance Criteria.

Written and/or oral evidence is required to demonstrate that the candidate has achieved Outcomes 1 to 4 to the standards required in the Performance Criteria. Candidates will be required to demonstrate their knowledge of compressors, HVLP turbines, fluid/paint feed systems, spray guns and their containers, application faults, setting up faults and equipment faults (troubleshooting) by the completion of a question paper. This assessment will be conducted under closed-book, controlled, supervised conditions. However, to encourage safety, the use of equipment operating/safe handling manuals can be used by candidates when answering troubleshooting questions.

Product and performance evidence is required to demonstrate that the candidate has achieved Outcome 5 to the standards specified in the Performance Criteria. The candidates will be required to complete four spraying tests. The tests will require the candidates to spray either solvent borne or water borne primer/undercoat, eggshell, gloss paints and/or multi-coloured material using compressor Suction, Gravity and Pressure fed guns, and an HVLP system. Assessment of this Outcome will be evidenced through observation of work processes and assessment of the completed pieces of work. Candidates must meet the given standards and tolerances during the practical assessments. An assessor observation checklist must be used to record this evidence. Assessment should be conducted under controlled, supervised conditions.

National Unit specification: statement of standards (cont)

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Outcome 5

Summary of standards (working towards industrial tolerances)	
Item	Measurement of standard
Protects surfaces for spraying operations	Immediately adjacent surfaces masked Masking tape finished to correct position and firmly fixed Masking paper and/or film correctly used where required De-masking on completion without damage to the surface No overspray evident on adjacent surfaces
Fits and wears PPE suitable for paint spraying	Equipment of the correct type for spraying operations, is selected Equipment correctly fitted and worn Equipment maintained correctly after use.
Prepare materials for spraying	Paint materials mixed in compliance with manufacturer's instructions Material mixed, decanted, strained and thinned correctly
Spraying equipment tested and correctly set up	Spray system components and compressors checked and correctly assembled Air pressures to gun are correctly set appropriate to system being used Material reloading procedures are carried out safely
Spraying application technique meets required standard	Even coating applied with minimum evidence of of the following defects: <ul style="list-style-type: none"> ◆ runs and sags ◆ dry misty coating ◆ arcing ◆ banding ◆ orange peel ◆ misses
Health and safety requirements met under current regulations	Complies at all times Local exhaust ventilation system must be used, if appropriate
Risk assessment	Safety boots worn at all times Overalls worn at all times Safety glasses worn at all times Particulate respirators worn during all Spraying operations Equipment used correctly at all times Equipment cleaned and stored safely after all spraying operations

National Unit specification: support notes

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This part of the Unit specification is offered as guidance. The support notes are not mandatory.

While the exact time allocated to this Unit is at the discretion of the centre, the notional design length is 80 hours.

Guidance on the content and context for this Unit

This Unit has been developed as a mandatory Unit in the Professional Development Award in Painting and Decorating at SCQF level 6.

The successful completion of this Unit will provide candidates with the required underpinning knowledge and skills relating to the, selecting, setting up and using various types of compressed air and HVLP equipment. This Unit will also focus on the setting up and using compressor suction, pressure and gravity feed systems and HVLP systems, in order that the candidate can apply paint coatings by spray. The use of solvent borne and/or water borne and/or multicoloured paint coatings is at the discretion of the delivery centre, however, candidates must demonstrate knowledge of cleaning air spray systems after use with both solvent and water based coatings.

This Unit should be offered to candidates from the painting and decorating industry.

This Unit will deal with the preparation of candidates for the completion of four spraying tests. It should be delivered as part of a structured programme of training and orientated to the context of the candidate's work area of responsibility.

Health and safety and sustainability is integral and key to the construction industry, therefore, throughout the Unit, emphasis will be placed where appropriate on the application of health and safety and sustainability. Safety working practices should be looked at in accordance with current safety codes of practice and regulations. Sustainability should include reference to the criteria of affecting sustainability, the impact of not implementing sustainability on the environment and the legislation promoting sustainability and reducing Volatile Organic Compounds VOCs.

Guidance on learning and teaching approaches for this Unit

The candidates should be given every opportunity to practice spraying application techniques with various systems and different guns through the initial tasks and/or naturally occurring practical projects, in order that they can successfully achieve the standards specified in all spraying tests. Safe use and working knowledge of compressed air equipment should be instilled within the candidate from an early stage. Underpinning knowledge should ensure the candidates can troubleshoot and diagnose application, setting up and equipment faults, and can recognise where faults can be remedied by the operative (on site) or whether the faults require to be rectified by a specialised spray equipment service engineer.

National Unit specification: support notes (cont)

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Opportunities should be taken throughout the delivery of this Unit to meet the requirements of the generic Units of the Training and Assessment Programme including:

- ◆ *Conform to General Workplace Health, Safety and Welfare*
- ◆ *Confirm Work Activities and Resources for the Work*
- ◆ *Develop and Maintain Good Working Relationships*
- ◆ *Confirm the Occupational Method of Work*
- ◆ *Conform to Productive Working Practices*
- ◆ *Move, Handle or Store Resources*

Guidance on approaches to assessment for this Unit

Detailed assessment material for this Unit will be found in Section 6 of the Painting and Decorating Training and Assessment Programme (TAP). Centres may use the instruments of assessment which they consider to be most appropriate but are advised to use the TAP which has been developed centrally by SQA. Any other instruments of assessment used must be comparable to the TAP and have been through prior verification.

The candidate's knowledge and understanding of terminology, air spray systems, and compressed air equipment will be assessed through a question paper.

Candidates should be given as much practice in spraying application techniques, prior to being set the assessment. Practical setting up of the equipment safely should be reinforced. Evidence will be gathered for Outcome 5 through observation that the candidates have met the given standards and tolerances during the practical assessment. An assessor observation checklist should be used to record this evidence.

Opportunities for the use of e-assessment

E-assessment may be appropriate for some assessments in this Unit. By e-assessment we mean assessment which is supported by Information and Communication Technology (ICT), such as e-testing or the use of e-portfolios or social software. Centres which wish to use e-assessment must ensure that the national standard is applied to all candidate evidence and that conditions of assessment as specified in the Evidence Requirements are met, regardless of the mode of gathering evidence. Further advice is available in *SQA Guidelines on Online Assessment for Further Education (AA1641, March 2003)*, *SQA Guidelines on e-assessment for Schools (BD2625, June 2005)*.

Opportunities for developing Core Skills

The Core Skill of *Problem Solving* will be developed as candidates undertake this Unit. Candidates will need to take account of a range of factors in order to work efficiently and safely, such as the choice of tools, appropriate materials, safety issues, safety equipment and sustainability. Individual discussions with assessors will enhance the evaluation of efficient working practices.

National Unit specification: support notes (cont)

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There are opportunities to develop the Core Skill of *Working with Others* at SCQF level 4. Candidates will have the opportunity to work with others as they plan and set out work surfaces, requisition equipment, and check equipment. They will also be required to work in groups to set up, clean dismantle and store equipment after use. The candidates will also work in groups completing risk assessments. Candidates can agree responsibilities and provide support and information to each other during the assessments. After assessment, they should be encouraged to consider how effectively they supported each other.

There will be opportunities for candidates to develop the Core Skill of *Communication* at SCQF level 4. Candidates will have the opportunity to develop written and/or communication skills for the knowledge part of the assessment in covering Outcomes 1 to 5.

The Core Skill of *Information and Communication Technology (ICT)* at SCQF level 3 will be developed by candidates researching Health and Safety legislation affecting their area of work and by visiting sites related to airless spraying equipment.

This Unit has the Critical Thinking component of Problem Solving embedded in it. This means that when candidates achieve the Unit, their Core Skills profile will also be updated to show they have achieved Critical Thinking at SCQF level 5.

Disabled candidates and/or those with additional support needs

The additional support needs of individual candidates should be taken into account when planning learning experiences, selecting assessment instruments, or considering whether any reasonable adjustments may be required. Further advice can be found on our website www.sqa.org.uk/assessmentarrangements

History of changes to Unit

Version	Description of change	Date

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