National Unit Specification: general information

UNIT Painting and Decorating: Properties of Water-borne Coatings (SCQF level 6)

CODE F7A1 12

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 the properties of water-borne coatings. This Unit is designed to enable candidates to develop knowledge and understanding of common water-borne surface coatings which will help them prepare and apply the products in a professional manner to produce finishes to the required Industry standards. Knowledge of the constituents of water-borne coatings will enable the candidates to select and use them as appropriate to the given task. This Unit will help candidates develop an awareness of the need for environmental protection, not only in the use of the products, but also in the disposal of residual waste materials.

OUTCOMES

1 Describe the functions of common water-borne coating types.
2 Describe common film formers and their functions.
3 Describe common pigment types and their functions.
4 Describe common solvents/thinners and their functions.
5 Describe common additives and their functions.

RECOMMENDED ENTRY

While entry is at the discretion of the centre, candidates undertaking the Professional Development Award in Painting and Decorating at SCQF level 6 must meet the requirements of the Modern Apprenticeship which include being employed in the relevant craft industry.

Administrative Information

Superclass: TG

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National Unit Specification: general information (cont)

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CREDIT VALUE

0.5 credit at SCQF level 6 (3 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

There is no automatic certification of Core Skills or Core Skill components in this Unit. Opportunities for developing aspects of the following Core Skills are highlighted in Support Notes of this Unit

- *Problem Solving* at SCQF level 4
- *ICT* at SCQF level 3
- *Communication* at SCQF level 4

National Unit Specification: statement of standards

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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

Describe the functions of common water-borne coating types.

Performance Criteria

(a) Describe the functions of common primers and sealers correctly.
(b) Describe the functions of common undercoats correctly.
(c) Describe the functions of common pigmented finishing types correctly.
(d) Describe the functions of non-pigmented finishing types correctly.

OUTCOME 2

Describe common water-borne film formers and their functions.

Performance Criteria

(a) Describe the function of film formers within a water-borne surface coating.
(b) Describe the drying and hardening processes of film formers.
(c) State the atmospheric influences on the drying and hardening processes.
(d) Define film former terminology correctly.

OUTCOME 3

Describe common pigment types and their functions.

Performance Criteria

(a) Describe pigment types and their functions within surface coatings.
(b) Describe common methods of pigment production.
(c) Describe the effect of pigment on coating.
(c) State the atmospheric influences on colour retention.
(d) Define pigment terminology correctly.

National Unit Specification: statement of standards (cont)

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OUTCOME 4

Describe common solvents/thinners and their functions.

Performance Criteria

(a) Describe the functions of solvents and thinners correctly.
(b) Describe the effects of solvents and thinners on coatings.
(c) Describe the health and safety hazards associated with the use and disposal of solvents and thinners.
(d) Define solvent and thinner terminology correctly.

OUTCOME 5

Describe common additives and their functions.

Performance Criteria

(a) State common water-borne surface coating additives.
(b) Describe the functions of additives and their effects on the coatings.
(c) Define additives terminology correctly.

EVIDENCE REQUIREMENTS FOR THIS UNIT

These evidence requirements will me met by the completion of the Training and Assessment Programme (TAP) for Painting and Decorating.

Written and/oral evidence is required to demonstrate that the candidate has achieved all Outcomes to the standard specified in the Performance Criteria. Candidates will be required to demonstrate their knowledge of terminology relating to constituents of common water-borne coatings, and to the techniques and practices used to prepare them for application. This assessment will take the form of a question paper, and will be conducted under controlled, closed book conditions.

Product and performance evidence is required to demonstrate that the candidate has achieved all Outcomes to the standards specified in the Performance Criteria. Candidates will be required to use correct terminology in relation to surface coating constituents, and to demonstrate skills in preparing water-borne coatings for application. They will also be required to demonstrate appropriate health and safety practices, and to use waste disposal procedures which fall in line with legislation.

Assessment of these Outcomes will be evidenced through observation of preparatory work processes for the coatings in use, and assessment at each stage of the progression of work as it is completed. Candidates must meet the given standards and tolerances during the practical assessments. An assessor observation checklist must be used to record this evidence, and assessment should be conducted under controlled, supervised conditions which must reflect conditions likely to be encountered in the workplace.

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 20 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.

Candidates successfully completing this Unit will have developed the underpinning knowledge relating to the water-borne coatings which will be applied in the Painting and Decorating TAP, and will help them to understand the properties of materials used. The knowledge will enable them to communicate more professionally by using the terminology related to surface coatings; to adjust/test/readjust them for application purposes, to select, use and clean tools and equipment correctly, and to use them safely in accordance with current legislation.

The Unit should be offered to candidates from the construction and related or similarly structured industries, and the skills are transferable within different working environments. The Unit is primarily aimed at candidates whose normal place of work would be a site, workshop, or similar type of work environment.

The Unit deals specifically with the properties and functions of water-borne coatings and their constituents, and could be integrated with the delivery of the Unit *Painting and Decorating: Applying Water-borne Surface Coatings* or related Unit within the PDA. Whilst there will be many opportunities to reinforce surface coatings technology within a workshop situation, it is recommended that this Unit be taught in a classroom/laboratory, with simple experiments being carried out by candidates where possible.

Health and safety and sustainability are 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 legislation and approved codes of practice. Sustainability should include reference to criteria affecting sustainability, impact of not implementing sustainability on the environment and the legislation promoting sustainability

GUIDANCE ON LEARNING AND TEACHING APPROACHES FOR THIS UNIT

Outcome 1

Candidates should be given information which will not only allow them to differentiate between the various coatings types within a system, but also to describe the part they play within the finished protective film. This can be reinforced within the workshop when candidates will be using the common range of water-borne coatings, and should develop the knowledge of suitability in use of the various types.

National Unit Specification: support notes (cont)

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Special emphasis must be placed on current legislation; not only that dealing with the aspects of environmental concerns regarding waste disposal, but more so on the areas of health and safety and personal risks to operatives which may be posed by using these coating types over a concentrated period of time.

Outcome 2

Knowledge of the common binders used in water-borne coatings plays an important part in the development of the skills used for application of these coating types, and candidates should be familiar with related terminology. Understanding the drying and hardening processes of the film formers are most important mainly for the reason of recoating times and candidates must be made aware of the effect which atmospheric conditions will have on them, both beneficial and detrimental.

Outcome 3

Candidates should be made aware of the roles played by the pigments in water-borne coatings, and the reasons why some are more suited than others for inclusion as a constituent in these coating types.

The methods of pigment production should help candidates understand characteristics related to their suitability, or otherwise, for use in the common water-borne coating types, and familiarise them with some of the more common pigment colours used today. They should also be familiar with the possible effect of natural light on pigments, and the associated terminology related to pigmentation of coatings.

Outcome 4

Candidates should be made aware that water-borne coatings also have a solvent content required to dissolve the film formers, and emphasis should be placed on the relationship between the solvent and the binder, and how the addition of water can affect application techniques, and subsequent drying of the film. Atmospheric conditions, although covered in Outcome 2, should be reinforced in relation to the release of solvents and the water content, which will affect the drying/recoating times.

The importance of observing updated current legislation which relates to coating developments should be impressed on candidates, with emphasis on the health related issues for operatives. Awareness of correct waste disposal must be given, with information on how this can be accomplished successfully within the law.

Outcome 5

Candidates should know the common additives used in water-borne coatings, what their functions are, and how they can affect the application processes, drying processes, and long term usefulness for substrate protection. They should be able to differentiate between additives included at the manufacturing stages, and those which can be utilised by the operative on-site to assist with the given task.

The knowledge of water-borne coatings, their components, and their functions are integral to their application by candidates; the tools, equipment and techniques related to their application to surfaces; the systems and materials used for cleaning tools and equipment, and the health and safety aspects in their use.

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Candidates should be made aware of the roles played by the pigments in a surface coating, and be familiar with the methods of pigment production which should help candidates understand characteristics related to their suitability, or otherwise, for use in the common water-borne coating types, and familiarise them with some of the more common pigment colours used today. They should also be familiar with the possible effect of natural light on pigments, and the associated terminology related to pigmentation of coatings.

Underpinning knowledge delivery should be related directly to the skills, materials and tools and equipment which are used in workshops/projects. Centres are encouraged to develop the craft science resources which will support the learning process by practical experiments where possible, and to make use of ICT facilities to deliver not only the underpinning knowledge, but also develop the skills required for e-learning.

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

- Conform to General Workplace Safety
- Confirm Work Activities and Resources for the Work
- Develop and Maintain Good Working Relationships
- Confirm the Occupational Method of Work
- Conform to Efficient Working Practices
- Move and Handle Resources.

OPPORTUNITIES FOR CORE SKILL DEVELOPMENT

The Core Skill of *Problem Solving* at SCQF level 4 could 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 choice of tools and equipment, appropriateness of materials, workplace/personal health and safety issues, and sustainability. Individual interaction with assessors will enhance the evaluation of candidate's efficient working practices.

Opportunities also arise for candidates to develop the Core Skill of *Information and Communication Technology* at SCQF level 3 by researching constituents of water-borne coatings, and current Health and Safety Legislation relating to the areas of work particular to this Unit.

There could be opportunities for candidates to develop the Core Skill of *Communication* at SCQF level 4, as they will have the opportunity to develop written and/or oral communication skills for all Outcomes.

GUIDANCE ON APPROACHES TO ASSESSMENT FOR THIS UNIT

Detailed assessment material for this Unit will be found in section 3 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 Painting and Decorating 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.

National Unit Specification: support notes (cont)

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The candidate's knowledge and understanding of components/terminology, techniques and painting practices related to the application of water-borne surface coatings and will be assessed through a question paper.

Centres should work towards underpinning knowledge assessments set out within the TAP and comply with any guidance given as to the procedures required for candidate participation in assessment.

Candidates should be given as much practise as possible in preparing and applying water-borne surface coatings prior to being set the assessment. Evidence will be gathered through observation of work processes and assessment during the completion of the workpieces to ensure 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 e-checklists. 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)*.

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**.