



## National unit specification

### General information

**Unit title:** Dental Materials: an Introduction (SCQF level 6)

**Unit code:** HK5H 46

**Superclass:** PF

**Publication date:** April 2017

**Source:** Scottish Qualifications Authority

**Version:** 01

### Unit purpose

This unit has been designed to develop learners' underpinning knowledge and understanding of a range of dental materials used in the construction of metallic and non-metallic oral appliances.

This is an introductory unit, mandatory within the National Certificate in Dental Technology at SCQF level 6, so is appropriate for trainee Dental Technicians.

### Outcomes

On successful completion of the unit the learner will be able to:

- 1 Describe the properties and uses of a range of materials used in dental cast production.
- 2 Describe the properties and uses of a range of materials used in the production of oral appliances.
- 3 Describe the properties and uses of materials used in the production of metallic oral appliances.

### Credit points and level

1 National unit credit at SCQF level 6: (6 SCQF credit points at SCQF level 6)

### Recommended entry to the unit

Access to this unit is at the discretion of the centre. It would be beneficial if learners had successfully completed or be working towards the unit *Dental Care Professionals: Fitness to Practice*.

## **National unit specification: General information (cont)**

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### **Core Skills**

Opportunities to develop aspects of Core Skills are highlighted in the support notes for this unit specification.

There is no automatic certification of Core Skills or Core Skill components in this unit.

### **Context for delivery**

If this unit is delivered as part of a group award, it is recommended that it should be taught and assessed within the subject area of the group award to which it contributes.

### **Equality and inclusion**

This unit specification has been designed to ensure that there are no unnecessary barriers to learning or assessment. The individual needs of learners should be taken into account when planning learning experiences, selecting assessment methods or considering alternative evidence.

Further advice can be found on our website [www.sqa.org.uk/assessmentarrangements](http://www.sqa.org.uk/assessmentarrangements).

## **National unit specification: Statement of standards**

**Unit title:** Dental Materials: an Introduction (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**

Describe the properties and uses of a range of materials used in dental cast production.

#### **Performance criteria**

- (a) Describe the properties and uses for Plaster of Paris
- (b) Describe the properties and use of Dental Stone
- (c) Describe the properties and uses of Type 3 Stones
- (d) Describe the characteristics of the specialised 3D printing materials used in the manufacture of dental casts

### **Outcome 2**

Describe the properties and uses of a range of materials used in the production of oral appliances.

#### **Performance criteria**

- (a) Describe the properties and uses of Poly Methyl-Methacrylate
- (b) Describe the properties and uses of Thermo Formed Materials
- (c) Describe the properties and uses of Ceramic Materials
- (d) Describe the properties and uses of Spray Resins and Light Cure Materials

### **Outcome 3**

Describe the properties and uses of materials used in the production of metallic oral appliances.

#### **Performance criteria**

- (a) Describe the properties and uses of Gold Alloys
- (b) Describe the properties and uses of Stainless Steel
- (c) Describe the properties and uses of Solders and Fluxes
- (d) Describe the properties and uses of Investment Materials

## **National unit specification: Statement of standards (cont)**

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### **Evidence requirements for this unit**

Evidence is required to demonstrate that learners have achieved all outcomes and performance criteria.

Evidence must be provided to show that learners can demonstrate understanding of information, materials, terminology, practices and techniques related to the use of dental materials.

For Outcome 1, learners must provide evidence of the following under closed-book conditions:

Description of two properties and one use for each of the following:

- ◆ Plaster of Paris
- ◆ Dental Stone
- ◆ Type 3 Stones
- ◆ Specialised material used in 3D printing
- ◆ Poly Methyl-Methacrylate
- ◆ Thermo Formed Materials
- ◆ Ceramic Materials
- ◆ Spray Resins and Light Cure Materials
- ◆ Gold Alloys
- ◆ Stainless Steel
- ◆ Solders and Fluxes
- ◆ Investment Materials

Description to include:

- ◆ Chemical formula
- ◆ Setting expansion
- ◆ Setting times
- ◆ Strength and hardness
- ◆ Advantages and disadvantages of materials



## National unit support notes

**Unit title:** Dental Materials: an Introduction (SCQF level 6)

Unit support notes are offered as guidance and are not mandatory.

While the exact time allocated to this unit is at the discretion of the centre, the notional design length is 40 hours.

### Guidance on the content and context for this unit

This introductory unit forms part of the NC in Dental Technology at SCQF level 6. It will develop learner's knowledge and understanding of dental materials used in the production of a range of appliances. The importance of safe use of all equipment including electrical and personal protective equipment (PPE), cleanliness and tidiness should be highlighted to learners.

Outcome 1 is designed to provide learners with the underpinning knowledge of materials used in the production of dental casts. To enable the learner to be able to describe the properties of materials and their uses, the following content should be covered:

- ◆ Correct consideration for Gypsum/Water ratio
- ◆ Appropriate Mixing equipment
- ◆ Correct spatulation considering setting time and expansion
- ◆ Addition of chemicals to influence setting time and expansion
- ◆ Consideration of cross infection policies
- ◆ Consideration of anatomical detail
- ◆ Consideration of density of Cast, surface hardness and reproduction of detail
- ◆ Correct trimming of Casts considering function required

Outcome 2 is designed to provide learners with the underpinning knowledge of materials used in the production of non-metallic oral appliances. The following content should be covered:

- ◆ Intro to Hydro Carbons
- ◆ Chemistry of Polymers
- ◆ Constituents of Monomer/Polymer
- ◆ Uses of polymers for Oral appliances
- ◆ Faults
- ◆ Types of Dental Ceramics
- ◆ Constituents of ceramic materials
- ◆ Properties/Uses
- ◆ Structure of ceramic materials
- ◆ Manufacture of ceramic materials

## National unit support notes (cont)

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- ◆ Practical use
- ◆ Reinforced and Strengthened ceramics
- ◆ Bonding ceramics to metal
- ◆ Castable ceramics

Outcome 3 is designed to provide learners with the underpinning knowledge of materials used in the production of metallic oral appliances. The following content should be covered:

- ◆ Introduction to dental alloys
- ◆ Constituents of dental alloys
- ◆ Properties of dental alloys
- ◆ Manipulation of dental alloys
- ◆ Melting of dental alloys
- ◆ Finishing of dental alloys
- ◆ Uses of dental alloys
- ◆ Investment materials used in the production of metallic oral appliances
- ◆ Fluxes and solders used in the production of metallic oral appliances

### Guidance on approaches to delivery of this unit

The learning and teaching of the properties of and uses for Dental Materials is most effective when concepts, principles and theories are set in a relevant context eg by making reference to applications of the materials in real life situations. There is scope for integration with other introductory units, eg *Dental Care Professionals: Fitness to Practice* and *Dental Cast Production: an Introduction*.

Learning and teaching approaches should include lectures, practical demonstrations, group work and individual exercises. Resources used could include impressions casts and audio visual material.

Broader informal discussions may be incorporated to clarify difficulties and it may be beneficial to discuss industry constraints, eg timescales and costs. The importance of accurate adherence to prescriptions should be highlighted as well as safe working practices at all times. Learners can be signposted to relevant aspects of the following for further information on these topics.

- ◆ Medicines and Healthcare Regulatory Agency (MHRA)
- ◆ Health and Safety at Work Act

### Guidance on approaches to assessment of this unit

Evidence can be generated using different types of assessment. The following are suggestions only. There may be other methods that would be more suitable to learners.

Centres are reminded that prior verification of centre-devised assessments would help to ensure that the national standard is being met. Where learners experience a range of assessment methods, this helps them to develop different skills that should be transferable to work or further and higher education.

## National unit support notes (cont)

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An appropriate instrument of assessment for this unit would be a series of short answer and/or multiple choice questions delivered in a single assessment paper under closed-book conditions. This could be via paper based assessment or e-assessment and would allow for integration of assessment from other relevant units.

### Opportunities for 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 learner evidence and that conditions of assessment as specified in the evidence requirements are met, regardless of the mode of gathering evidence. The most up-to-date guidance on the use of e-assessment to support SQA's qualifications is available at [www.sqa.org.uk/e-assessment](http://www.sqa.org.uk/e-assessment).

### Opportunities for developing Core and other essential skills

There will be opportunities to develop aspects of the Core Skills in *Communication* (Oral and Written skills) and *Information and Communication Technology (ICT)* (Accessing Information), *Numeracy* (Graphical Information, Using Number – Measuring and Calculation), *Working with Others* (Working Co-operatively with Others) and *Problem Solving* (Critical Thinking) throughout this unit.

There may also be opportunities to develop broader transferable skills which contribute to employability:

- ◆ Time management and organisational skills — through working to deadlines, punctuality, record keeping
- ◆ Sustainability — through consideration of the use of resources, recycling and waste
- ◆ Interpersonal skills such as listening, teamwork and study skills
- ◆ Personal development, eg self-confidence and self-motivation

## History of changes to unit

Version	Description of change	Date

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## General information for learners

### Unit title: Dental Materials: an Introduction (SCQF level 6)

This section will help you decide whether this is the unit for you by explaining what the unit is about, what you should know or be able to do before you start, what you will need to do during the unit and opportunities for further learning and employment.

This unit has been designed to develop your knowledge and understanding of dental materials. It is suitable for trainee Dental Technicians and is an introductory unit which forms part of the NC in Dental Technology at SCQF level 6.

If you undertake this unit, you will learn about the properties and uses for a range of dental materials.

There are three outcomes to complete:

- 1 Describe the properties and uses of a range of materials used in dental cast production.
- 2 Describe the properties and uses of a range of materials used in the production of oral appliances.
- 3 Describe the properties and uses of materials used in the production of metallic oral appliances.

Assessment may include set question papers comprised of short answer and multiple choice questions.

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