

**GENERIC OCCUPATIONAL STANDARDS FOR DENTAL TECHNOLOGY
STANDARDS PACK FOR
ORTHODONTIC CUSTOM-MADE DENTAL DEVICES
January 2006**

Background

This is one of four packs containing the detailed draft Generic Occupational Standards for dental technology. They are:

1. Initial Assessment, Preparation and Advice
2. Prosthetic custom-made dental devices
3. Restorative custom-made dental devices
4. Orthodontic custom-made dental devices.

This pack contains the following:

ORTHODONTIC DEVICES	
EDT20	Produce and prepare casts and records for the design of orthodontic appliances
EDT21	Design and manufacture functional orthodontic appliances
EDT22	Design and manufacture fixed orthodontic appliances
EDT23	Design and manufacture removable orthodontic appliances
Knowledge and understanding that individuals need to develop and apply to meet the standards	

You have two main tasks to do in relation to these standards. You should do these in the order given.

1. Check the translation
 - a) Is the translation accurate?
 - b) Is it understandable in your country?
 - c) If not, what language should be used?
 - d) If unsure, check with the UK expert group, what the correct meaning is in English.
2. Verify the standards
 - a) Do the draft standards describe best practice in your country?
 - b) If not, what is best practice in your country – please provide detailed information on what should be changed and why.

We need to develop European standards that work in every country and every language. As there can only be one standard, we will all need to compromise.

UNIT

EDT20 Produce and prepare casts and records for the design of orthodontic appliances

Information about this unit

This unit focuses on producing and preparing casts and records for the design of orthodontic appliances.

Scope of this standard

- 1 Orthodontic appliances:
 - a) functional
 - b) fixed
 - c) conventional removable appliances
 - d) complex removable appliances.

- 2 Casts:
 - a) orthodontic study cast
 - b) working cast
 - c) duplicate cast.

- 3 Cast and die material:
 - a) resin
 - b) polymeric
 - c) gypsum
 - d) modified stone
 - e) metallic
 - f) refractory.

Performance criteria

The worker will need to:

- 1 correctly determine the prescription requirements from the information available
- 2 effectively clean and disinfect the received impression, confirm that it is free of voids or defects which render it unacceptable and prepare it appropriately to receive the cast material
- 3 inform the client in an appropriate manner if the impression is not of sufficient quality and obtain a replacement impression
- 4 correctly prepare cast material¹ that is appropriate for:
 - the process
 - the nature of the impression material
- 5 pour the material correctly into the impression to produce a cast that:
 - provide an accurate positive image of the impression
 - are dense
 - are free from voids or other visible defects
- 6 trim the cast using an appropriate trimmer so that:
 - bases are level
 - it is free from extraneous material, and
 - essential anatomical detail is retained
- 7 trim study casts consistent with Angle's recommendations for study cast production
- 8 fill any small voids in the cast and finish it so that it meets auditing and recording requirements
- 9 correctly identify the cast with the patient's unique reference
- 10 remove from the cast those teeth that are to be extracted between appointments² if this is prescribed in the treatment plan
- 11 prepare appropriately the plaster teeth on the cast to accommodate any necessary wire components
- 12 review the cast and the prescription and make an accurate and justifiable assessment of the technical feasibility of:
 - meeting the prescription requirements
 - the prescribed appliance achieving the required function
- 13 contact the client without delay if the feasibility is in doubt, explaining the reasons for the decision and proposing other options.
- 14 identify and classify malocclusions into recognised and accepted classification systems

¹ Appropriate cast materials would include: plaster, orthodontic stone or other appropriate material; it may be processed using a vacuum mixer or vibrator.

² Plaster teeth which are to be extracted between appointments² will include supernumerary teeth or deciduous teeth.

- 15 make complete, accurate and up to date records relating to the classification of the malocclusion in a manner that can be used to monitor the movement of the teeth and the progress of the case

UNIT

EDT21 Design and manufacture functional orthodontic appliances

Information about this unit

Summary

This unit describes standards for the construction of functional orthodontic appliances and covers the processes of manufacturing custom-made components, assembling components, blocking out; application of polymeric (through powder and liquid build up techniques, pouring or moulding techniques as used in the construction of prosthetics), curing/processing of polymeric and the final finishing processes. Functional orthodontic appliances are complex specialist custom-made dental appliances which are used to correct skeletal and dentoalveolar discrepancies in the developing child or young adult.

There are four elements

- EDT21.1 Design, manufacture and position components of functional orthodontic appliances
- EDT21.2 Assemble and manufacture functional orthodontic appliances
- EDT21.3 Join components to construct functional orthodontic appliances
- EDT21.4 Trim, finish polish and evaluate functional orthodontic appliances.

Scope of this standard

- 1 Casts:
 - a) working casts
 - b) orthodontic study casts
 - c) duplicate casts.

- 2 Components:
 - a) active
 - b) passive
 - c) fixative.

- 3 Functional orthodontic appliances:
 - a) inclined plane
 - b) activators (including modified activators)
 - c) functional regulators
 - d) mandibular advancement systems
 - e) mandibular retraction systems
 - f) maxillary intrusion systems.

- 2 Polymeric material:
 - a) heat cure
 - b) self cure
 - c) light cure

Element

EDT21.1 Design, manufacture and position components of functional orthodontic appliances

Performance criteria

The worker will need to:

- 1 identify from an analysis of the patient's treatment plan the need for any modifications to the cast and make any such modifications prior to manufacture
- 2 analyse the cast and identify:
 - the malocclusion and development problem that are to be corrected
 - the tooth movement and retention that will be required to correct the malocclusion
 - the components that will be required to achieve the required function
- 3 design a functional orthodontic appliance and its individual components which:
 - has the potential to achieve the required function within the patient's mouth³
 - incorporates sufficient anchorage and fixation
 - achieves the best possible balance between function, aesthetics and cost
- 4 determine the depth of and block out undercut areas⁴ which might:
 - prevent removal or insertion of the appliance
 - cause ulceration in situ
- 5 select an appropriate articulator and articulate casts correctly using the postured jaw relationship provided by the client
- 6 prepare and block out the cast in a manner which is suitable for the processing method to be used
- 7 select and use appropriate spacing materials to make any necessary modifications to the cast
- 8 evaluate the cast and design and decide on the basis of cost, time and function:
 - where pre-formed components can be used within the appliance
 - which components will need to be custom-made
 - any necessary adjustments to component design
- 9 select the required pre-formed components, make any necessary modifications for them to perform the correct function, and confirm they are fit for purpose
- 10 select wire of the correct gauge and material for the required custom-made components, cut it accurately to the required length and straighten it in a manner which avoids unwanted material stress
- 11 form wire components to the required design and size in a manner which minimises the risks of over-work of the material
- 12 repeatedly check components during manufacture to confirm that:

³ Modification might include removing material from the soft tissue areas to promote periosteal stretching.

⁴ Blocking out is in relation to: preventing the incursion of polymeric material and to allow the required range of movement for the individual component.

- they fit to the cast
 - they provide the correct extensions against the working cast
 - they will not damage surrounding tissues in the mouth
 - the developing appliance is complying with the prescription and design and make any adjustments which are required
- 13 evaluate the design of the developing appliance to confirm that it:
- will function as required by the prescription
 - will not interfere with or damage the patient's tissues.

Element

EDT21.2 Assemble and manufacture functional orthodontic appliances

Performance criteria

The worker will need to:

- 1 fix components:
 - securely in the required position to the cast to prevent their movement during processing
 - in a manner which is appropriate to the processing method to be used
- 2 prepare the cast suitably for the application of polymeric material in a manner appropriate to:
 - the type of polymeric material
 - the curing process to be used
- 3 apply appropriate material to the cast to form a baseplate of the required thickness and extension which will secure the components effectively and to provide the required function
- 4 select and use appropriate materials for manufacturing the functional orthodontic appliance required in the prescription
- 5 process the appliance using equipment and techniques which are appropriate to:
 - the baseplate material
 - the strength and type of finish required
- 6 produce any required interlocking posterior guideplanes of a sufficient thickness of polymeric material to:
 - open the bite to the degree required in the prescription
 - meet the pre-determined angulation specified by the client
- 7 separate the appliance from the cast once processing is complete, and appropriately clean the appliance in preparation for finishing and polishing.

Element

EDT21.3 Join components to construct functional orthodontic appliances

Performance criteria

The worker will need to:

- 1 select methods, materials and equipment for joining components that are appropriate to:
 - the type and materials of the components to be joined
 - the strength and type of join required
- 2 identify accurately areas where a soldered joint would not interfere with the function and performance of the component being joined
- 3 position components:
 - accurately for the design
 - in a manner that enables the optimum join to be made
- 4 calibrate the level and duration of current in spot-welding equipment so that it is correct for the size, thickness and type of material to be joined
- 5 confirm that electrodes are free from erosion and take the appropriate action to remedy those that display levels of erosion which are likely to adversely affect the quality of the join
- 6 identify accurately areas where a spot-welded joint would not interfere with the function and performance of the component, correctly position components and accurately spot-weld them at the correct points to form secure, strong and viable joins
- 7 accurately apply flux to those areas where solder is required and block out with anti-flux those where solder is not required so that:
 - there is no incursion of solder
 - the required range of movement is allowed
- 8 apply an appropriate heat-protective material to minimise damage to surrounding areas
- 9 heat components to be soldered to a temperature that:
 - is sufficient to melt and control the flow of the solder
 - is sufficient to form a bond
 - prevents damage to the metallurgical properties of the components being joined
- 10 apply and control the solder to:
 - give an even flow
 - achieve the thickness and coverage required for optimum durability and maximum strength
- 11 evaluate each finished join for its:
 - position
 - strength
 - integrity
 - function

- fitness for purpose
and remake any which give cause for concern
- 12 place the appliance on the cast after joining and check that the appliance:
 - fits the cast
 - complies with the prescription
 - will not damage surrounding tissues in the patient's mouthand make any necessary adjustments
 - 13 remove flux, anti-flux and excess solder once welding and soldering is complete, replace the appliance on the cast and confirm the fit
 - 14 finish and polish metal components to leave a smooth surface free of sharp edges and irregularities.

Element

EDT21.4 Trim, finish polish and evaluate functional orthodontic appliances

Performance criteria

The worker will need to:

- 1 select methods, materials and equipment for trimming, finishing and polishing functional orthodontic appliances that are appropriate to the type and materials of the components in the appliance
- 2 confirm that the active components have the full range of movement required in the prescription
- 3 trim and finish the baseplate to the thickness and coverage required
- 4 finish and polish metal components to leave smooth surfaces that are free of sharp edges and irregularities and which do not cause damage to the patient's tissues
- 5 evaluate the finished appliance and confirm that it:
 - is effective
 - fits the cast
 - is free of defects
 - meets the requirements of the planned design
 - complies with the prescription
 - is fit for purpose
- 6 correctly identify the finished appliance with the patient's unique reference and date of production
- 7 effectively clean and disinfect the finished appliance, prepare and package it safely for despatch together with instructions for the patient and client
- 8 make complete, accurate and up-to-date records relating to the identification, components and manufacture of the appliance and store the records in the correct location consistent with relevant legislation.

UNIT

EDT22 Design and manufacture fixed orthodontic appliances

Information about this unit

This unit describes the design and manufacture of fixed orthodontic appliances. This includes the processes of manufacturing fixed appliances themselves and the fixed components of fixed/removable appliances. It covers the processes of designing, manufacturing and positioning components, assembling and joining components, and final finishing.

There are three elements

EDT22.1 Design, manufacture and position components of fixed orthodontic appliances

EDT22.2 Assemble and join components to manufacture fixed orthodontic appliances

EDT22.3 Trim, finish polish and evaluate fixed orthodontic appliances.

Scope of this standard

- 1 Components whose function is to:
 - a) approximate teeth
 - b) distalise
 - c) procline
 - d) retract
 - e) maintain
 - f) intrude
 - g) extrude
 - h) retrocline.

- 2 Fixed orthodontic appliances:
 - a) active
 - b) passive
 - c) retentive.

- 3 Ancillary components
 - a) metallic
 - b) polymeric.

Element

EDT22.1 Design, manufacture and position components of fixed orthodontic appliances

Performance criteria

The worker will need to:

- 1 correctly identify the position of bands from the prescription and cast, and assess whether this location is likely to be technically and functionally acceptable
- 2 report immediately to the client any bands which have been incorrectly positioned on the cast and propose alternative positions which are more likely to be technically and functionally acceptable
- 3 determine whether the cast needs to be modified to design and manufacture the required fixed orthodontic appliance
- 4 evaluate the cast and design and decide on the basis of cost, time and function:
 - where pre-formed components can be used within the appliance
 - which components will need to be custom-made
 - any necessary adjustments to component design
- 5 select the required pre-formed components, make any necessary modifications for them to perform the correct function, and confirm they are fit for purpose
- 6 prepare clean and sculpted surfaces on those areas of the cast where bands are to be attached which are appropriate to the band and the method of attachment
- 7 attach preformed bands to the correct teeth on the cast and confirm they:
 - fit
 - are secure
 - will form a firm and stable base for the appliance
- 8 form custom-made bands from stainless steel tape:
 - of the appropriate size for the tooth to be banded
 - to the correct tooth contour on the cast
 - to cover the tooth surface
 - which are clear of the occlusal surface
 - which do not and will not interfere with eruption or occlusion
 - free of sharp edges
 - which are joined securely on the most appropriate side
- 9 select wire of the correct gauge and material for the required custom-made components, cut it accurately to the required length and straighten it in a manner which avoids unwanted material stress
- 10 form wire components to the required design and size in a manner which minimises the risks of over-work of the material
- 11 repeatedly check components during manufacture to confirm that:
 - they fit to the cast

- they provide the correct extensions against the working cast
 - they will not damage surrounding tissues in the mouth
 - the developing appliance is complying with the prescription and design and make any adjustments which are required
- 12 evaluate the design of the developing appliance to confirm that it:
- will function as required by the prescription
 - will not interfere with or damage the patient's tissues.

Element

EDT22.2 Assemble and join components to manufacture fixed orthodontic appliances

Performance criteria

The worker will need to:

- 1 assemble the appliance and confirm that components are fixed onto the cast:
 - securely
 - in the required position
 - using an appropriate material
- 2 prepare wire components⁵ and the cast for joining to bands in a manner appropriate to the materials used
- 3 select methods, materials and equipment for joining components that are appropriate to:
 - the type and materials of the components to be joined
 - the strength and type of join required
 - the sequence in which the components need to be joined
- 4 identify accurately areas where a soldered joint would not interfere with the function and performance of the component being joined
- 5 position components:
 - accurately for the design
 - in a manner that enables the optimum join to be made
- 6 calibrate the level and duration of current in spot-welding equipment so that it is correct for the size, thickness and type of material to be joined
- 7 confirm that electrodes are free from erosion and take the appropriate action to remedy those that display levels of erosion which are likely to adversely affect the quality of the join
- 8 identify accurately areas where a spot-welded join would not interfere with the function and performance of the component, correctly position components and accurately spot-weld them at the correct points to form secure, strong and viable joins
- 9 accurately apply flux to those areas where solder is required and block out with anti-flux those where solder is not required so that:
 - there is no incursion of solder
 - the required range of movement is allowed
- 10 apply an appropriate heat-protective material to minimise damage to surrounding areas
- 11 heat components to be soldered to a temperature that:
 - is sufficient to melt and control the flow of the solder
 - is sufficient to form a bond
 - prevents damage to the metallurgical properties of the components being joined

⁵ Wire components would include: bars, springs, tubes, cleats and locking systems, bows, bands, screws and arches.

- 12 apply and control the solder to:
 - give an even flow
 - achieve the thickness and coverage required for optimum durability and maximum strength

- 13 place the appliance on the cast after joining and check that the appliance:
 - fits the cast
 - complies with the prescription
 - will not damage surrounding tissues in the patient's mouthand make any necessary adjustments

- 14 evaluate each finished join for its:
 - position
 - strength
 - integrity
 - function
 - fitness for purposeand remake any which give cause for concern

- 15 remove flux, anti-flux and excess solder once welding and soldering is complete, replace the appliance on the cast and confirm the fit

- 16 remove oxide from the surfaces of bands and wire components and finish and polish metal components to leave a smooth surface free of sharp edges and irregularities.

Element

EDT22.3 Trim, finish polish and evaluate fixed orthodontic appliances

Performance criteria

The worker will need to:

- 1 remove any residual wax and resin to allow the active components free range of movement as specified in the prescription
- 2 select methods, materials and equipment for trimming, finishing and polishing the fixed orthodontic appliance which are appropriate to the type and materials of the components in the appliance
- 3 trim and polish the appliance to leave smooth fitting and polished surfaces free of sharp edges and irregularities that may cause damage to the patient's teeth, bones and soft tissues
- 4 identify any further ancillary components which need to be added to the appliance, reposition the trimmed and polished appliance on the cast and plan the procedure
- 5 block out with an appropriate material any undercuts for the addition of ancillary components, add any required wax outline and prepare the cast using an appropriate separating medium for any additional polymeric components
- 6 apply material to form any required ancillary components, trim and finish them to the thickness and coverage required leaving smooth surfaces that are free of sharp edges and irregularities
- 7 evaluate the finished appliance and confirm that it:
 - is effective
 - fits the cast
 - is free of defects
 - meets the requirements of the planned design
 - complies with the prescription
 - is fit for purpose
- 8 correctly identify the finished appliance with the patient's unique reference and date of production
- 9 effectively clean and disinfect the finished appliance, prepare and package it safely for despatch together with instructions for the patient and client
- 10 make complete, accurate and up-to-date records relating to the identification, components and manufacture of the appliance and store the records in the correct location consistent with relevant legislation.

UNIT

EDT23 Design and manufacture removable orthodontic appliances

Information about this unit

This unit describes the manufacture of removable orthodontic appliances – both conventional and complex (ie one which is complex in design and function and/or which involves the modification of a conventional design). It covers the processes of manufacturing components, assembling components, blocking out, surveying and undercut relief; application of appropriate baseplate material, processing of polymeric and the final finishing processes.

There are four elements

EDT23.1 Design, manufacture and position components of removable orthodontic appliances

EDT23.2 Assemble and manufacture removable orthodontic appliances

EDT23.3 Join components to construct removable orthodontic appliances

EDT23.4 Trim, finish, polish and evaluate removable orthodontic appliances.

Scope of this standard

- 1 Removable orthodontic appliances:
 - a) passive
 - b) active.

- 2 Components:
 - a) active (including springs, piston screws, expansion screws, open screws, bows (eg Kloen))
 - b) passive (including biteplanes, stops, thermo-formed retainers, Kesling positioners, guardwires)
 - c) fixation (including baseplates, tubing, hooks, clasps, acrylic baseplates)
 - d) anchorage.

- 3 Casts:
 - a) working
 - b) orthodontic study
 - c) duplicate.

- 4 Biteplanes:
 - a) flat anterior
 - b) inclined anterior
 - c) posterior.

Element

EDT23.1 Design, manufacture and position components of removable orthodontic appliances

Performance criteria

The worker will need to:

- 1 analyse the prescription and the cast and identify:
 - the malocclusion and development problem that are to be corrected
 - the tooth movement and retention that is required to correct the malocclusion
 - the components that are required to achieve the required function
- 2 where necessary, design an appliance which:
 - has the potential to achieve the required function within the patient's mouth
 - incorporates sufficient anchorage and fixation
 - achieves the best balance between function, aesthetics and cost
- 3 contact the client without delay if it is not feasible to meet the requirements of the prescription and propose options for the appliance design
- 4 evaluate whether the cast needs to be modified to design and manufacture the required removable orthodontic appliance
- 5 evaluate the cast and design and decide on the basis of cost, time and function:
 - where pre-formed components can be used within the appliance
 - which components will need to be custom-made
 - any necessary adjustments to component design
- 6 identify and select the pre-formed components which are required, make any modifications to them that are necessary to ensure that they will perform the correct function, and confirm that they are fit for purpose
- 7 locate casts correctly with the jaw relationship provided by the client
- 8 select wire of the correct gauge and material for the required custom-made components, cut it accurately to the required length and straighten it in a manner which avoids unwanted material stress
- 9 form components to the required design and size in a manner which minimises the risks of over-work of the material
- 10 repeatedly check components during manufacture to confirm that:
 - they fit the cast
 - they provide the correct extensions against the working cast
 - they will not damage surrounding tissues in the mouth
 - the developing appliance is complying with the prescription and designand make any adjustments which are required

- 11 position on the cast those components that apply fixation so that they:
 - accurately engage appropriate undercuts
 - provide a firm and stable base for the appliance

- 12 accurately position the active and passive components of the appliance in the specified location on the cast and confirm their:
 - fit
 - security
 - compliance with the functional and aesthetic requirements of the prescription.

Element

EDT23.2 Assemble and manufacture removable orthodontic appliances

Performance criteria

The worker will need to:

- 1 accurately identify active components and areas surrounding teeth and tissue and block them out correctly with the appropriate material⁶
- 2 fix components:
 - securely in the required position to the cast to prevent their movement during processing
 - in a manner which is appropriate to the processing method to be used
- 3 identify from an examination of the prescription and casts any artificial teeth which are required
- 4 select the appropriate type of any required artificial teeth and modify them to accurately match the patient's:
 - tooth shade
 - tooth size
 - cuspal forms
 - natural dentition
- 5 securely attach any required artificial teeth in the correct position in the baseplate using an appropriate material and produce:
 - an occlusion appropriate to the prescription and natural dentition
 - the required aesthetic appearance
 - balanced articulation whenever this is possible
- 6 prepare the cast in a manner appropriate to:
 - the type of baseplate and biteplane material to be applied
 - the processing method to be used
- 7 apply appropriate material to the cast to form a baseplate of the required thickness and extension
- 8 incorporate within the baseplate any required motivational and decorative material in a position which:
 - allows for maximum visibility
 - will not interfere with the function of the appliance
- 9 identify from the cast and design the type, height and extension of biteplane that is necessary for the appliance and articulate casts in a manner appropriate for the construction of this biteplane
- 10 form a biteplane of a sufficient thickness of polymeric:
 - to produce the desired movement
 - which are accurate to the degree required in the design
- 11 correctly manufacture any two part moulds which are required for prosthetic packing

⁶ Blocking out is in relation to: preventing the incursion of baseplate material and to allow the required range of movement for the individual component.

- 12 process appliances using equipment and techniques which are appropriate to:
 - the baseplate material
 - the required strength of finish
- 13 remove the appliance from the cast in a manner that minimises the likelihood of damage and remove any excess cast material from the appliances
- 14 confirm that processing has been effective in producing a baseplate and biteplane which are:
 - sufficiently hard
 - sufficiently dense
 - free of porosity
- 15 confirm that the components are secure within the baseplate and the active components are free to move in the required manner.

Element

EDT23.3 Join components to construct removable orthodontic appliances

Performance criteria

The worker will need to:

- 1 select methods, materials and equipment for joining components that are appropriate to:
 - the type and materials of the components to be joined
 - the strength and type of join required
- 2 identify accurately areas where a soldered joint would not interfere with the function and performance of the component being joined
- 3 position components:
 - accurately for the design
 - in a manner that enables the optimum join to be made
- 4 calibrate the level and duration of current in spot-welding equipment so that it is correct for the size, thickness and type of material to be joined
- 5 confirm that electrodes are free from erosion and take the appropriate action to remedy those that display levels of erosion which are likely to adversely affect the quality of the join
- 6 identify accurately areas where a spot-welded joint would not interfere with the function and performance of the component, correctly position components and accurately spot-weld them at the correct points to form secure, strong and viable joins
- 7 accurately apply flux to those areas where solder is required and block out with anti-flux those where solder is not required so that:
 - there is no incursion of solder
 - the required range of movement is allowed
- 8 apply an appropriate heat-protective material to minimise damage to surrounding areas
- 9 heat components to be soldered to a temperature that:
 - is sufficient to melt and control the flow of the solder
 - is sufficient to form a bond
 - prevents damage to the metallurgical properties of the components being joined
- 10 apply and control the solder to:
 - give an even flow
 - achieve the thickness and coverage required for optimum durability and maximum strength
- 11 evaluate each finished join for its:
 - position
 - strength
 - integrity
 - function

- fitness for purpose
and remake any which give cause for concern
- 12 place the appliance on the cast after joining and check that the appliance:
 - fits the cast
 - complies with the prescription
 - will not damage surrounding tissues in the patient's mouthand make any necessary adjustments
 - 13 remove flux, anti-flux and excess solder once welding and soldering is complete, replace the appliance on the cast and confirm the fit
 - 14 finish and polish metal components to leave a smooth surface free of sharp edges and irregularities.

Element

EDT23.4 Trim, finish, polish and evaluate removable orthodontic appliances

Performance criteria

The worker will need to:

- 1 select methods, materials and equipment for trimming, finishing and polishing removable orthodontic appliances that are appropriate to the type and materials of the components in the appliance
- 2 confirm that:
 - the edges of the biteplanes are recognisable against the opposing working cast
 - the active components have the full range of movement required in the prescription
- 3 trim and finish the baseplate to the thickness and coverage required
- 4 finish and polish metal components to leave smooth surfaces that are free of sharp edges and irregularities and which do not cause damage to the patient's tissues
- 5 evaluate the finished appliance and confirm that it:
 - is effective
 - fits the cast
 - is free of defects
 - meets the requirements of the planned design
 - complies with the prescription
 - is fit for purpose
- 6 correctly identify the finished appliance with the patient's unique reference and date of production
- 7 effectively clean and disinfect the finished appliance, prepare and package it safely for despatch together with instructions for the patient and client
- 8 make complete, accurate and up-to-date records relating to the identification, components and manufacture of the appliance and store the records in the correct location consistent with relevant legislation.

KNOWLEDGE AND UNDERSTANDING FOR STANDARDS EDT20 – EDT23 RELATING TO ORTHODONTIC DENTAL DEVICES

The table below shows the knowledge and understanding that is needed to be able to reach the required standards. The code of the different standards is given in the horizontal axis and items of knowledge and understanding are shown in the vertical column. The proposed relevance of the individual items to the different standards is shown using a 'X' in the relevant cells of the table.

Items of knowledge and understanding		EDT20	EDT21	EDT22	EDT23
A	Anatomy, physiology, pathology and microbiology				
1	the skeletal anatomy and physiology of the head and neck	X	X	X	X
2	tooth morphology (both deciduous and permanent) including crowns and roots, and the form of the anterior and posterior teeth	X	X	X	X
3	the aetiology and classifications of malocclusions	X	X	X	X
4	growth and eruption patterns of both deciduous and permanent teeth	X	X	X	X
5	the structure, function, and movement of the oro-facial musculature (including the tongue) and temporomandibular joint	X	X	X	X
6	disorders and diseases affecting the oral cavity (eg angular cheilitis and denture stomatitis, candidiasis, erosive lichen planus and chronic aphthous ulceration and dry mouth)	X	X	X	X
7	growth and development of maxilla and mandible	X	X	X	X
8	the physiological changes related to tooth movement	X	X	X	X
9	limitations of growth modifications; restrictions and contraindications to growth modification		X	X	X
10	the broader factors (sociological, behavioural, environmental and economic) that contribute to oral health and illness.	X	X	X	X
B	Orthodontic treatment				
1	the aims and objectives of orthodontic treatment	X	X	X	X
2	key factors in the success of orthodontic treatment (ie anchorage, fixation, retention), common problems and the common causes of failure of treatment		X	X	X
3	the stages in, and types of, orthodontic treatment and how they relate to each other	X	X	X	X
4	principles of design and manufacture of functional orthodontic appliances	X	X		X
5	the different types of orthodontic appliances and the materials, equipment and components that are required; the purposes and uses of each	X	X	X	
6	the different types of functional orthodontic appliances and the components that are required		X		

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Items of knowledge and understanding		EDT20	EDT21	EDT22	EDT23
7	the different components used in functional orthodontic appliances, the purposes and uses of each		X		
8	the scope of orthodontic treatment using functional orthodontic appliances		X		
9	the principles of fixed orthodontic appliance design and construction			X	
10	the scope of orthodontic treatment using fixed orthodontic appliances (including the range and direction of movement possible)			X	
11	indications and contra-indications for fixed appliance treatment			X	
12	the different types of fixed orthodontic appliances and the components that are required			X	
13	the function of different components used in fixed orthodontic appliances, the positioning, purposes, functions and uses of each			X	
14	the principles of removable orthodontic appliance design and manufacture	X	X		X
15	the scope of orthodontic treatment using removable orthodontic appliances				X
16	the different types of removable orthodontic appliances and the components that are required				X
17	the different components used in removable orthodontic appliances, the purposes and uses of each				X
18	the nature and purpose of study casts	X	X	X	x
19	the use of casts in the design, manufacture and positioning of components for appliances	X	X	X	X
20	the principles of Angles cast trimming, how to apply them and evaluate the outcomes	X			X
21	the records (paper and material) that are required	X	X	X	X
22	how to identify the size and type of components that will be required		X	X	X
23	principles of baseplate and interlocking posterior guideplane design and construction		X		X
24	application and magnitude of the forces used in the movement of teeth and the development of mandibular growth		X		X
25	methods of activation and reactivation of components		X	X	X
26	methods of activation and reactivation of functional appliances		X		
27	methods of activation and reactivation of removable appliances				X
28	how appliances are fitted, adjusted and activated		X	X	X
29	methods of modification, repair and maintenance of functional appliances		X		X
30	methods of modification, repair and maintenance of removable appliances				X
31	principles and application of myofunctional appliance technology		X		

GENERIC OCCUPATIONAL STANDARDS FOR DENTAL TECHNOLOGY

Items of knowledge and understanding		EDT20	EDT21	EDT22	EDT23
32	methods of measurement and analysis of cephalometrics, eg characteristics, skeletal patterns, facial height, incisor relationships		X		
33	uses of combined treatments	X	X	X	X
34	interaction of treatments		X	X	X
C	Selecting and fabricating components				
1	how the curing process affects the choice of materials and manufacturing processes		X	X	X
2	how to identify the size and type of components that will be required		X	X	X
3	the range of pre-formed components that are available and methods to assess their suitability for use in constructing an appliance		X	X	X
4	the different gauges of wire that are used for different types of components and methods for identifying which is required and suitable		X	X	X
5	methods of straightening and bending wire and the tools that are used		X	X	X
6	handling tolerances of wires, the effects of over-handling and how to identify when this has happened		X	X	X
7	the purpose, function and use of protective equipment in the manufacture of components		X	X	X
8	methods of assessing the suitability of manufactured components		X	X	X
9	the purpose and use of the different types of biteplanes and how these are constructed		X	X	X
10	methods for the application of polymeric, why different techniques are used		X	X	X
D	Spot welding and soldering				
1	uses of spot welding and soldering - when, where, how, why and what		X	X	X
2	how the duration and level of current affects the strength and viability of the join produced		X	X	X
3	methods of calibrating equipment, how to determine the correct settings for the size and type of materials being welded		X	X	X
4	how to judge when metals have been heated sufficiently to melt solder, but not interfere with the metal's mechanical structure		X	X	X
5	the consequences of over-heating metals and solder during soldering (such as weakening and softening metals and causing solder to spatter rather than flow smoothly), the effect of these on the strength and integrity of the join and the remedial action that can be taken		X	X	X
6	how to identify reasons for soldered joint failure		X	X	X
E	Curing process				

GENERIC OCCUPATIONAL STANDARDS FOR DENTAL TECHNOLOGY

Items of knowledge and understanding		EDT20	EDT21	EDT22	EDT23
1	the different curing methods, how each works, their effect and the situations in which each is best used		X	X	X
2	how the curing process affects the materials and components that can be used		X	X	X
3	physical characteristics of materials used in appliances and how the curing processes affect them		X	X	X
4	the different separating media, when and why these are used		X	X	X
5	methods of deflasking		X	X	X
6	the ways in which appliances are cleaned in preparation for finishing and polishing		X	X	X
F Finishing and polishing					
1	techniques for finishing and polishing appliances		X	X	X
2	the different types of abrasive and polish, the purposes and uses of each		X	X	X
3	methods for the safe, effective disinfection of appliances		X	X	X
4	methods of assessing and checking the safety, aesthetic, functional and clinical acceptability of completed appliances		X	X	X
G Articulation systems					
1	principles of balanced articulation and its effect on the function of functional orthodontic appliances	X	X	X	X
2	the selection of a suitable articulator for the type of appliance being designed and manufactured		X	X	X
3	centric occlusion records		X	X	X
4	lateral and protrusive movement records and their uses	X	X	X	X
5	analysis of dentate occlusions requiring onlays		X	X	X
H Health and safety and the control of infection					
1	methods of protection against contamination and cross-infection when handling received impressions and other items which may have been in the mouth, or which are intended to be placed in the mouth; why it is important to do so	X	X	X	X
2	personal hygiene and the use of personal protective equipment	X	X	X	X
3	methods for the safe moving, handling and storage of materials and equipment	X	X	X	X
4	location, function and use of emergency equipment	X	X	X	X
I Quality assurance					
1	the reasons for maintaining records throughout the process and of clearly identifying the	X	X	X	X

GENERIC OCCUPATIONAL STANDARDS FOR DENTAL TECHNOLOGY

Items of knowledge and understanding		EDT20	EDT21	EDT22	EDT23
	products during the manufacturing process				
2	organisational procedures and requirements for the recording of information about incoming work, work in progress and work delivered to clients, and the purpose of this	X	X	X	X
3	quality audit systems: their purpose, nature and procedures; impact of the Medical Devices Directive on the recording of incoming work, the detailed design and manufacturing specification and the recording of materials and processes	X	X	X	X
4	principles of quality assurance (including effective recording and sampling); processes and procedures for quality assurance in the worker's workplace	X	X	X	X
5	methods of setting and calibrating equipment and of testing that this is correct	X	X	X	X
6	the effects of modifying manufacturers' products to meet laboratory requirements on the physical properties of products, on quality assured products and the legal implications (eg of inaccurate mixing, inadequate processing).	X	X	X	X
J	Legislation, policies and procedures				
1	the requirements of the Medical Devices Directive in monitoring the progress of devices through the production process	X	X	X	X
2	legal requirements of the contract of employment, confidentiality and employers' regulations	X	X	X	X
3	legislation relating to health and safety at work, environmental protection, and control of hazardous substances, and related procedures and liability; principles of, and how to apply, legislation and regulations	X	X	X	X
4	legal requirements relating to third party insurance.	X	X	X	X
K	Statutory registration				
1	the roles and responsibilities of different members of the oral healthcare team (and the wider health and social care team)	X	X	X	X
2	regulatory functions relating to the oral healthcare team in the country in which one is working	X	X	X	X
3	legal and ethical obligations of regulated members of the oral healthcare team	X	X	X	X
4	the need for lifelong learning and professional development and responsibilities in relation to this for regulated members of the oral healthcare team	X	X	X	X
5	the oral healthcare team's wider responsibility to the community as a whole.	X	X	X	X

GLOSSARY

Cast	is a dimensionally accurate positive form of areas of the oral cavity produced from a negative impression.
Client	the member of the oral health care team who has prescribed the custom-made prosthesis. Clients may be external to the organisation (such as other laboratories, dental practitioners, training schools) or internal (eg within a dental hospital).
Die	is a section of a cast of an individual tooth.
Patient	is the individual for whom the custom-made prosthesis is being made and/or the parents/guardians of the patient when s/he is a new-born child