

## Overview

"This standard describes the design and manufacture, using manual or digital techniques, 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. The term 'client' has been used to mean the clinician who has prescribed and specified the orthodontic appliance. Clients may be external to the organisation (such as other laboratories, dental practitioners, training schools) or internal (within a dental hospital). The individual is the one for whom the appliance is being made. Users of this standard will need to ensure that practice reflects up to date information and policies."

## Performance criteria

### *You must be able to:*

1. access and accurately interpret all relevant work instructions and information
2. work safely at all times and in accordance with all relevant legislation, guidelines, policies, procedures and protocols
3. deal promptly and effectively with any problems within your control and report those which cannot be solved
4. communicate with relevant others at a pace, manner and level appropriate to their understanding, preferences and needs
5. identify and minimise hazards and risk in the workplace
6. collate all specification information required for the design and manufacture of the fixed orthodontic appliances
7. confirm accuracy of the specification with relevant others
8. select the necessary components, materials and equipment and confirm that they are fit for purpose
9. set up the manufacturing equipment in accordance with the specification
10. manufacture the fixed orthodontic appliances using appropriate methods and techniques
11. monitor the manufacturing process and adjust as required
12. deinvest or retrieve the manufactured product using an appropriate method which releases the item without causing damage
13. check that the manufactured product matches the specification and make any necessary adjustments
14. dispose of waste in accordance with organisational procedures
15. complete and store all relevant documentation in accordance with organisational requirements"

## Knowledge and understanding

### *You need to know and understand:*

1. the current legislation, guidelines, policies, procedures and protocols which are relevant to your work practice and to which you must adhere
2. the scope and limitations of your own competence, responsibilities and accountability as it applies to your job role
3. how to access and interpret all relevant work instructions and information
4. specific procedures for reporting issues which are beyond your competence, responsibilities and accountability
5. the duty to report any acts or omissions that could be unsafe/detrimental to you or others
6. how to communicate with relevant others at a pace, manner and level appropriate to their understanding, preferences and needs
7. the hazards and risks which may arise during the execution of your work role and how you can minimise these
8. the correct use of any equipment and PPE to protect the health and safety of you and others
9. the principles and use of digital design and manufacturing
10. relevant digital manufacturing equipment, methods and techniques
11. skeletal anatomy, physiology and tooth morphology necessary for fixed orthodontic appliance construction
12. the function and movement of the oral musculature and temporomandibular joint
13. principles of balanced articulation and its effect on the function of fixed orthodontic appliances
14. disorders and diseases affecting the oral cavity
15. the aetiology and classifications of malocclusions
16. growth and eruption patterns of both deciduous and permanent teeth
17. the physiological changes related to tooth movement
18. growth and development of maxilla and mandible
19. limitations of growth modifications; restrictions and contraindications to growth modification
20. the broader factors (sociological, behavioural, environmental and economic) that contribute to oral health and illness
21. the principles of fixed orthodontic appliance design and construction
22. the scope of orthodontic treatment using fixed orthodontic appliances including the

range and direction of movement possible

23. indications and contra-indications for fixed appliance treatment

24. the different types of fixed orthodontic appliances and the components that are required

25. the function of different components used in fixed orthodontic appliances, the positioning, purposes, functions and uses of each

26. the use of casts in the design, manufacture and positioning of components for appliances

27. uses of combined treatments

28. interaction of treatments

29. how the curing process affects the choice of materials and manufacturing processes

30. how to identify the size and type of components that will be required

31. the range of pre-formed components that are available and methods to assess their suitability for use in constructing an appliance

32. the different gauges of wire that are used for different types of components and methods for identifying which is required and suitable

33. methods of straightening and bending wire and the tools that are used

34. handling tolerances of wires, the effects of over-handling and how to identify when this has happened

35. the purpose, function and use of protective equipment in the manufacture of components

36. methods of assessing the suitability of manufactured components

37. the purpose and use of the different types of biteplanes and how these are constructed

38. methods for the application of polymeric, why different techniques are used

39. uses of spot welding and soldering

40. how the duration and level of current affects the strength and viability of the join produced

41. methods of calibrating equipment, how to determine the correct settings for the size and type of materials being welded

42. how to judge when metals have been heated sufficiently to melt solder, but not interfere with the metal's mechanical structure

43. the consequences of over-heating metals and solder during soldering specifically 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

44. how to identify reasons for soldered joint failure
45. the different curing methods, how each works, their effect and the situations in which each is best used
46. how the curing process affects the materials and components that can be used
47. physical characteristics of materials used in appliances and how the curing processes affect them
48. the different separating media, when and why these are used
49. methods of deflasking
50. the ways in which appliances are cleaned in preparation for finishing and polishing
51. techniques for finishing and polishing appliances
52. the different types of abrasive and polish and their purpose
53. methods for the safe and effective cleaning of appliances
54. methods of assessing and checking the safety, aesthetic, functional and clinical acceptability of completed appliances
55. the selection of a suitable articulator for the type of appliance being designed and manufactured
56. centric occlusion records
57. lateral and protrusive movement records and their uses
58. analysis of dentate occlusions requiring onlays
59. methods of developing, maintaining and improving communication and information relating to the provision of custom-made dental devices
60. methods of protection against contamination and infection control 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
61. principles of quality assurance including effective recording and sampling; processes and procedures for quality assurance in your workplace
62. methods of setting and calibrating equipment and of testing that this is correct
63. the effects of modifying manufacturers' products to meet laboratory requirements on the physical properties of products and on quality assured products, and the legal implications of poor manufacturing
64. the range of equipment used in the design and manufacture of dental devices
65. methods of using equipment and materials safely including the use of chemicals and other hazardous substances
66. methods of storing different equipment and materials safely and securely
67. methods of cleaning and maintaining different types of equipment

- 68. how to dispose of waste in accordance with organisational procedures
- 69. how to complete and safely store all relevant documentation in accordance with organisational requirements"

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