



**Australian Government**

**Department of Education, Employment and Workplace Relations**

# **HLTDT509D Construct cast metal alloy removeable partial denture framework**

**Release: 1**

## HLTDT509D Construct cast metal alloy removeable partial denture framework

### Modification History

HLT07 Version 4	HLT07 Version 5	Comments
HLTDT509C Construct cast metal alloy removable partial denture framework	HLTDT509D - Construct cast metal alloy removable partial denture framework	Unit updated in V5. ISC upgrade changes to remove references to old OHS legislation and replace with references to new WHS legislation. No change to competency outcome.

### Unit Descriptor

#### Descriptor

This unit of competency describes the skills and knowledge required to construct burn-out patterns for cast metal framework; and devest, trim, treat, finish and evaluate alloy structures

All procedures are carried out in accordance with work health and safety (WHS) policies and procedures, current infection control guidelines, Australian and New Zealand Standards, State/Territory legislative requirements and organisation policy

### Application of the Unit

#### Application

This unit applies to work in dental technology

### Licensing/Regulatory Information

Not Applicable

## Pre-Requisites

### Pre-requisite units

This unit must be assessed after successful achievement of pre-requisites:

- HLTDT301D Construct models
- HLTDT302D Construct custom impression trays
- HLTDT303D Construct registration rims
- HLTDT304D Articulate models and transfer records
- HLTDT519C Construct simple complete removable acrylic dentures and appliances
- HLTIN301C Comply with infection control policies and procedures

## Employability Skills Information

### Employability Skills

This unit contains Employability Skills

## Elements and Performance Criteria Pre-Content

Elements define the essential outcomes of a unit of competency.

The Performance Criteria specify the level of performance required to demonstrate achievement of the Element. Terms in italics are elaborated in the Range Statement.

## Elements and Performance Criteria

### ELEMENT

### PERFORMANCE CRITERIA

- |   |  |
|---|--|
| 1. Prepare master model                               | 1.1 Read and interpret the prescription<br>1.2 Select <i>alloy</i><br>1.3 Confirm the survey of model that has been carried out by the operator<br>1.4 Transfer design to master model<br>1.5 Block out undesirable undercuts<br>1.6 Create clasp ledges<br>1.7 Scribe food lines<br>1.8 Apply tissue relief<br>1.9 Apply saddle relief  |
| 2. Construct refractory model                         | 2.1 Duplicate master model in <i>refractory material</i> to produce an accurate copy of the model<br>2.2 Construct sprue former as necessary<br>2.3 Prepare the refractory model appropriately and apply an appropriate hardener or sealant  |
| 3. Wax and invest removable partial denture framework | 3.1 Transfer design outline correctly to the refractory model<br>3.2 Select appropriate wax and pre-formed components<br>3.3 Wax up patterns to the refractory cast consistent with the design<br>3.4 Sprue the pattern using material of the correct size and in the correct shape and position for the material being cast and attach it to the investment former<br>3.5 Select <i>appropriate investment and technique according to the alloy</i><br>3.6 Prepare <i>investment material</i> in accordance with manufacturer's instructions<br>3.7 Treat the surface of the wax, patterns and sprues<br>3.8 Allow for investment setting time in accordance with manufacturer's instructions |

**ELEMENT****PERFORMANCE CRITERIA**

4. Burnout and cast removable partial denture framework
  - 4.1 Select burn out and preheat cycles for appropriate investment/alloy combination
  - 4.2 Burn-out wax from investment mould and hold at recommended temperature for casting
  - 4.3 Melt alloy and cast using appropriate materials, equipment and technique
  
5. Deinvest, trim, finish and evaluate metallic structures for removable partial denture
  - 5.1 Select and apply cooling cycle
  - 5.2 Remove the cast alloy structure from the investment without damaging the integrity of the structure
  - 5.3 Remove oxides using an appropriate abrasive or chemical treatment
  - 5.4 *Visually examine the cast alloy structure, correctly identify any casting faults and assess the viability of the casting*
  - 5.5 Remove sprues and *trim and shape the alloy structure*
  - 5.6 Treat the surface of the alloy using appropriate materials and equipment and finish using appropriate abrasives and polishes
  - 5.7 Position the cast on the master model and check accuracy of major connection and clasps and adjust any metal occlusal contacts with antagonist
  - 5.8 Decontaminate the denture framework according to infection control guidelines
  - 5.9 Dry the denture framework, replace on model and place in a sealed container for dispatch

## Required Skills and Knowledge

This describes the essential skills and knowledge and their level required for this unit.

### *Essential knowledge:*

The candidate must be able to demonstrate essential knowledge required to effectively do the task outlined in elements and performance criteria of this unit, manage the task and manage contingencies in the context of the identified work role

This includes knowledge of:

- Applied oral anatomy
  - dentition - arrangement of the teeth, naming and coding of teeth
  - structures of the oral cavity - hard and soft palate, lateral and posterior borders of the oral cavity, tongue and floor of the mouth
  - teeth - form and function
- Dental alloys
- Heat treatment
- Infection control guidelines for the decontamination of completed laboratory work
- Melting and casting
- WHS and material safety data sheets
- Relevant material science for carrying out procedures
- Solidification
- Surface finishing

### *Essential skills:*

It is critical that the candidate demonstrate the ability to

- Consistently design and manufacture burn-out patterns for simple cast metal frameworks
- Consistently deinvest, trim, shape and evaluate cast alloy denture framework
- Consistently comply with current infection control guidelines, Australian Standards and legislative requirements as they relate to the dental technician's specific job role
- Consistently comply with work health and safety (WHS) policies and procedures as they relate to the dental technician's specific job role

In addition, the candidate must be able to effectively do the task outlined in elements and

performance criteria of this unit, manage the task and manage contingencies in the context of the identified work role

This includes the ability to:

- Consistently follow work health and safety (WHS) policies and procedures
- Consistently follow sequenced written instructions and manufacturer specifications for the preparation of materials
- Critically evaluate all work produced so as to consistently meet both the technical requirements of the laboratory and client requirements
- Select materials and techniques to manufacture cast metal alloy removable partial denture framework
- Use appropriate practices to ensure efficient use of power and other resources
- Use safe work practices to minimise the risk of transmission of infection including:
  - consistently following the procedure for washing and drying hands
  - consistently limiting contamination
  - consistently maintaining clean receiving and work areas
  - consistently putting into practice clean techniques
  - consistently using personal protective equipment
- Use literacy skills to read and follow directions, policies and procedures including:
  - infection control policies and procedures
  - laboratory policies and procedures
  - material safety data sheets
  - work health and safety (WHS) policies and procedures

## Evidence Guide

### EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for this Training Package.

*Critical aspects for assessment and evidence required to demonstrate this competency unit:*

- The individual being assessed must provide evidence of specified essential knowledge as well as skills
- Consistency of performance should be demonstrated over the required range of workplace situations

## EVIDENCE GUIDE

- Context of and specific resources for assessment:*
- Assessment should replicate workplace conditions as far as possible
  - Where, for reasons of safety, access to equipment and resources and space, assessment takes place away from the workplace, simulations should be used to represent workplace conditions as closely as possible
- Method of assessment*
- Evidence of essential knowledge and understanding may be provided by:
    - traditional or online (computer-based) assessment
    - written assignments/projects
  - Case study and scenario as a basis for discussion of issues and strategies to contribute to best practice
  - Questioning
  - Staff and/or client feedback
  - Supporting statement of supervisor
  - Authenticated evidence of relevant work experience and/or formal/informal learning
  - Role play/simulation
- Access and equity considerations:*
- All workers in the health industry should be aware of access and equity issues in relation to their own area of work
  - All workers should develop their ability to work in a culturally diverse environment
  - In recognition of particular health issues facing Aboriginal and Torres Strait Islander communities, workers should be aware of cultural, historical and current issues impacting on health of Aboriginal and Torres Strait Islander people
  - Assessors and trainers must take into account relevant access and equity issues, in particular relating to factors impacting on health of Aboriginal and/or Torres Strait Islander clients and communities



## EVIDENCE GUIDE

### *Related units:*

This unit should be assessed in conjunction with the following related competency unit:

- HLTDT508C Construct removable acrylic partial dentures

## Range Statement

### RANGE STATEMENT

The Range Statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance.

### *Alloys may include:*

- Cobalt chromium based alloys
- Gold alloys
  - traditional gold alloys
  - medium and low gold alloys
- Titanium alloys

### *Tissue relief provided to areas of the oral mucosa which may include:*

- Maxillary and mandibular tori
- Palatal areas
- Rugae
- Tuberosities

### *Melting/Casting techniques may include:*

- Arc melting
- Centrifugal casting
- Flame melting
- Gas pressure casting
- Induction melting
- Resistance melting
- Vacuum casting

## RANGE STATEMENT

*Visual examination of the cast alloy structure may include:*

Confirming that the cast:

- is effective
- fits the master model
- is free of defects
- meets the requirements of the planned design
- complies with the prescription
- is fit for the purpose

*Trim and shape the alloy structure may include:*

- Ensuring that the:
  - casting has no sharp edges
  - occlusal contacts with metal are removed
  - bubbles on the fitting surface are removed prior to fitting
  - clasps have appropriate form and dimension
  - connections with soft tissue are appropriately formed
  - food lines are clearly defined
  - components are all the correct size and shape

*Checking the alloy structure may include but is not limited to:*

- The accuracy of the casting
- The strength of the casting
- The integrity of the casting
- The surface finish of the casting

## Unit Sector(s)

Not Applicable