TECHNICAL BULLETIN

DISEASE PREVENTION AND CONTROL

# U.S. ARMY DENTAL LABORATORY PROSTHODONTIC SERVICE



HEADQUARTERS, DEPARTMENT OF THE ARMY

5 July 2011

TECHNICAL BULLETIN
MEDICAL 148*

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, DC 5 July 2011

# U.S. Army Dental Laboratory Prosthodontic Service

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* This bulletin supersedes TB MED 148, 1 June 2011

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# CHAPTER 1

# INTRODUCTION

## 1–1. Purpose and scope

*a*. The U.S. Army Dental Laboratory (USADL) performs professional prosthodontic and dental laboratory support for oral health activities of the uniformed services as directed by Headquarters, U.S. Army Medical Command.

*b*. Support includes professional guidance, consultation, and diagnostic services; dental laboratory services and fabrication of prostheses for restoration and replacement of lost tissue; specialized training and education programs; and publication of informational and instructional material for professional and technical personnel.

## 1–2. References

Appendix A provides a list of reference information.

## 1–3. Explanation of abbreviations

The glossary contains a list of abbreviations used in this publication.

## 1–4. Organization

Every U.S. Army dental clinic is provided with dental laboratory support. This support is divided into two distinct categories that include the local dental laboratory support and the USADL.

*a*. *Local dental laboratory support.* The organization of the dental activity (DENTAC) laboratory support is determined by the DENTAC commander and his/her designated laboratory officer.

*b*. *U.S. Army Dental Laboratory*. The USADL is a large dental laboratory staffed by approximately 100 dental laboratory technicians and is commanded by a dental officer. This laboratory is located in Building 322 at Fort Gordon, GA 30905-5650. It supports, on a global scale, all regional dental commands, and all current combat theaters of operation with deployed temporary or fixed dental facilities.

*c*. *U.S. Army Dental Laboratory services.* The USADL provides—

(1) *Construction and repair*. Construction and repair of dental restorations and prostheses of all types includes fixed and removable dental prostheses, complete dentures, orthodontic and pediatric dental appliances, surgical and radiological splints and prostheses, mouth protectors, sleep apnea appliances, and patient education models and teaching aids.

(2) *Consultation services.* Requests should be submitted using the Corporate Dental Application (CDA) Digital 2322 Laboratory Work Request (or Department of Defense (DD) Form 2322 (*Dental Laboratory Work Authorization*), along with full arch diagnostic casts and an interocclusal record.

(3) *Consultant visits.* The USADL commander or deputy commander may visit dental residency programs or DENTACs at the invitation of the residency program director or DENTAC commander to provide specialized training.

(4) *Continuing education*. Dental clinical-laboratory-relations courses will be presented as directed by the Office of The Surgeon General. Other continuing education activities will be held as required.

(5) *Publications*. Publications include informational and instructional material for professional and technical training.

*d*. *Dental laboratory consultant.* The Dental Corps chief has appointed the USADL commander as consultant for dental laboratory services.

(1) The USADL commander maintains active liaison with—

*(a)* U.S. Army Dental Command.

*(b)* Regional and DENTAC commanders.

*(c)* Designated Air Force and Navy dental officers.

(2) The consultant will monitor and adjust the Army workload by recommending negotiation of outsourcing support agreements. Upon mobilization, the consultant will take action through appropriate command channels to ensure expeditious fabrication of all essential dental prostheses within the prescribed health-service area for support of the expanded Army after Mobilization Day (or M-Day) for either a partial or full mobilization.

**1–5. Education and training**

*a*. The USADL conducts formal courses designed to acquaint dental officers with the role of the USADL in the clinical practice of prosthodontics. Considerations in case selection, as well as case submission, are identified for fixed dental prostheses (FDPs), complete dentures, and removable dental prostheses (RDPs). Established techniques are presented to enable the clinician to fully utilize the dental laboratory. Specific subject areas include submitting digital laboratory work requests, interocclusal jaw-relation records, master casts and dies, ceramic alloy restorations, repairs, as well as packaging, mailing, and helping to establish a new shipping destination. The student views incoming and outgoing work as well as actual fabrication techniques and participates in a practical laboratory exercise.

*b*. The DENTACs may request to send dental officers or technicians to the USADL for familiarization or specialized training in specific areas.

# CHAPTER 2

# ADMINISTRATIVE CONSIDERATIONS

## 2–1. Policies

*a*. To enhance the efficiency of the DENTAC Laboratory System and to control the USADL workload, the following procedures should be accomplished in local dental laboratories if possible:

(1) Model work and die preparation.
(2) Custom trays.
(3) Occlusion rims.
(4) Transitional RDPs.
(5) Single, all metal cast restorations.
(6) Simple metal (type III gold) FDPs.
(7) Acrylic resin processing.
(8) Partial and complete denture setups.

*b*. Only those above procedures, which are beyond the capability of the DENTAC, may be requested from the USADL. Direct communication between the DENTAC commander or his/her laboratory officer and the USADL commander or deputy commander is encouraged.

## 2–2. Corporate Dental Application Digital DD Form 2322

*a*. This form provides the dental laboratory technician with detailed and specific directions for fabrication of the requested dental restoration. Dental officers electronically complete and submit DD Form 2322 in the CDA. In addition, a printed and signed copy is sent with the case to the USADL. For dental laboratory procedures performed in local dental clinic laboratories, the Local CDA Digital 2322 Dental Laboratory Work Authorization (or DD Form 2322) hardcopy is used. The Local CDA Digital 2322 is available in the CDA program. (See https://conus.dencom.army.mil/.)

*b*. Instructions for completion of the CDA Digital 2322 are as follows:

(1) In the CDA Scheduler, locate the patient's appointment and right click on it.

(2) Select **Create USADL Dental Lab Order** in the dialog box. The USADL digital form has a bar code in the upper right corner; the Local form does not. Do not use the Local form to send cases to the USADL.

(3) Most blocks at the top of the form auto-populate with the patient's information. Block 10—"Unit Data"—may not auto-fill, but it is not required to be filled in for submission.

(4) In Block 12, select the type of restoration to be fabricated. If the case is a combination of two types (such as, Crown and Bridge and Removable), select "Split Case."

(5) In Block 13, enter the shade if the product requires a shade. If complicated shading is required, type "see below" in the block. Enter the shade requirements in the remarks section **after the products have been entered** or hand write them in detail on the printed form sent with the case to the USADL.

(6) Blocks 16–21 require at least one block to be checked.

(7) Blocks 22–25 are required only if the case includes one or more of the items.

(8) Check the "Disinfection Block" for assurance that the case has been disinfected.

(9) On the right side, select the status of the patient—

*(a)* DEPLOY. Soldiers currently deployed or deploying within 90 days.

*(b)* FTDR. First-Term Dental Readiness.

*(c)* NORMAL. Self-explanatory.

*(d)* Overseas Contingency Operation. Component two or three Soldiers (Army National Guard or Reserve).

*(e)* VIP. Very Important Persons (such as, General Officers, Post Command Sergeants Major (or CSMs), or other high-profile personnel).

*(f)* WTU. Warrior Transition Unit.

(10) Under **Product Group** at the bottom, select products for the case from the drop-down menu (see Appendix B). Record the amount. Metal, metal-ceramic, and all-ceramic restorations require use of the "Fill Mode." For these restorations, the program will automatically fill in Block 15. All other products require the design to be drawn by hand in Block 15 on the printed copy of the form sent with the case.

(11) Activate the "Fill Mode" if necessary by clicking on the large grey arrow at the top right of the form. Select the type of material from the list, and then click on the desired tooth. The teeth change color to indicate the material. Definitions of the materials in the list are as follows:

*(a) Type III (Yellow Gold)*. Self-explanatory.

*(b) Full Metal w/Screw*. Full-metal yellow or white gold (specify in "Clinician's Remarks" after all products have been entered) screw-retained implant crown.

*(c) PFM MO*. Porcelain-fused-to-metal unit with metal occlusion.

*(d) PFM MO w/Screw*. Screw-retained PFM unit with metal occlusion.

*(e) PFM PO*. PFM unit with porcelain occlusion.

*(f) PFM PO w/Screw*. Screw-retained PFM unit with porcelain occlusion.

*(g) Full Metal (White Gold).*

(12) The selected items appear in the "Tooth/Material" box directly below the "Fill Mode" box. Corrections or changes are made by removing and then replacing the selection with the correct choice. When correct, click on "Add to Product Group" at the bottom of the **Tooth/Material** box.

(13) In **Product Group** at the bottom of the form, verify the product, tooth number, and quantity. Click on "Add" at the end of the line to add the selected products to the "Clinician's Remarks" section.

(14) Products that do not require "Fill Mode" are added to the form in "Product Group." Select them in the drop-down menu; specify tooth if applicable, quantity, and then add. (See Appendix B.)

(15) All products that must be accomplished for the case must be requested (such as, articulation (one for each cast), wrought wires, porcelain butt (one for each unit)). Use the "QTY" (or quantity) tab to denote the amount for each product.

(16) Ensure that the computer is connected to a functional printer. Print out two copies of the form from the **Print Dialog** box. Sign and send one with the case, and file one for local records. Hand-draw the design of any "non-Fill Mode" product in Block 15 of the copy sent with the case.

(17) If the form does not print, do not make and submit another identical Digital 2322. Fix the printer, locate the saved form in CDA (Home—ADL—Case Lookup—Form 2322) and print out an addendum.

(18) Submit only one Digital 2322 for each case at a time.

(19) Changes to the case can be made at the USADL.

**2–3. Use of hardcopy DD Form 2322**

*a*. The hardcopy DD Form 2322 will be completed if access to CDA is not available for dental laboratory work performed at the local level. This form will be completed in duplicate and the file copy retained as an audit trail for precious metals and composite laboratory value (CLV) reporting (see Appendix C.)

*b.* It is extremely important that the administrative data in blocks 1 through 28, where applicable, be completed and typewritten/handwritten legibly (see figure 2–1). Specific guidance is provided as follows:

(1) *Block 1*. Enter the Local Case No.

(2) *Block 2*. Enter the complete mailing address and telephone number of the submitting clinician to include the ZIP code.

(3) *Block 3*. The USADL Case No. will be provided by the ADL.

(4) *Block 4*. Enter the patient's name as shown in figure 2–2.

(5) *Block 5*. Enter the last four of the patient's social security number (SSN).

(6) *Block 6.* Grade—utilize the pay grade of the sponsor (that is, Enlisted (E)-l to E-9, Officer (O)-1 to O-10, Warrant Officer (W)-l to W-5; civilian grade General Service (GS)-1 to GS-15; or other appropriate abbreviation).

(7) *Blocks 7 and 8.* See figures 2–2 and 2–3 for samples.

(8) *Block 9.* Beneficiary type—the service category will be completed using the following abbreviations:

*(a)* First code character—

*1*. Army—1.

*2*. Navy and Marine—2.

*3.* Air Force—3.

*4.* Other—4.

*5*. Family Member—5.

*(b)* Second code character—

*1*. Active Duty—1.

*2.* Retired—2.

*(c)* Example in block 9: 1-1, Army Active.

(9) *Blocks 10 and 11*. See figures 2–2 and 2–3 for samples.

*c.* The laboratory data part of DD Form 2322 (reverse side) is for laboratory use only and is self-explanatory.

**2–4. Priority in laboratory service**

Priority or "RUSH" fabrication is applicable for cases in six status categories, which are as follows:

*a.* Deployed Soldiers.
*b.* Soldiers within 90 days of deployment.
*c.* The FTDR Soldiers.
*d.* The WTU Soldiers.
*e.* The VIPs (General Officers, Post Commanders, and CSMs).
*f.* Cases of residents in U.S Army dental training programs.

(1) Cases submitted for deploying, FTDR, and WTU Soldiers must be accompanied by copies of official deployment orders documenting their status with the first five digits of the SSN blocked out. Justification for rush cases of VIPs must be provided on the DD Form 2322 submitted with the case. Direct communication between the program director and USADL commander is required for approval of priority fabrication for cases of dentists in residency training programs that require completion before graduation.

(2) The prescription must show in block 26 a suspense date that will satisfy the requirements of the patient. Leave and/or normal permanent change of station moves of the patient and/or doctor will not be considered as an adequate reason for requesting expeditious treatment of cases. It is the responsibility of the clinician to determine that adequate treatment time exists for the patient and/or doctor before the case is started.

(3) Ensure that the doctor's phone number is on the DD Form 2322 so that when required, the USADL may call to negotiate a final suspense date.

**2–5. Quality control**

*a.* All dental officers will comply with the provisions of this bulletin when submitting cases to the USADL. Every effort will be made by the USADL to follow the recommendations of dental officers concerning design, method of fabrication, and materials; however, the final decision rests with the USADL commander, who is authorized to return cases with appropriate remarks for correction/consultation. Upon the receipt of a properly signed request, the USADL assumes that the DENTAC commander of the submitting station has approved the patient's eligibility and treatment procedure. All prosthodontic prescriptions will be countersigned and dated as designated by the DENTAC/clinical laboratory officer.

*b.* When available, the DENTAC commander will designate a trained prosthodontist as his/her Dental Laboratory Officer to be responsible for the control and use of dental prosthodontic assets. He/she should evaluate and legibly sign the DD Form 2322 for all prosthodontic cases prior to the case being submitted to the USADL.

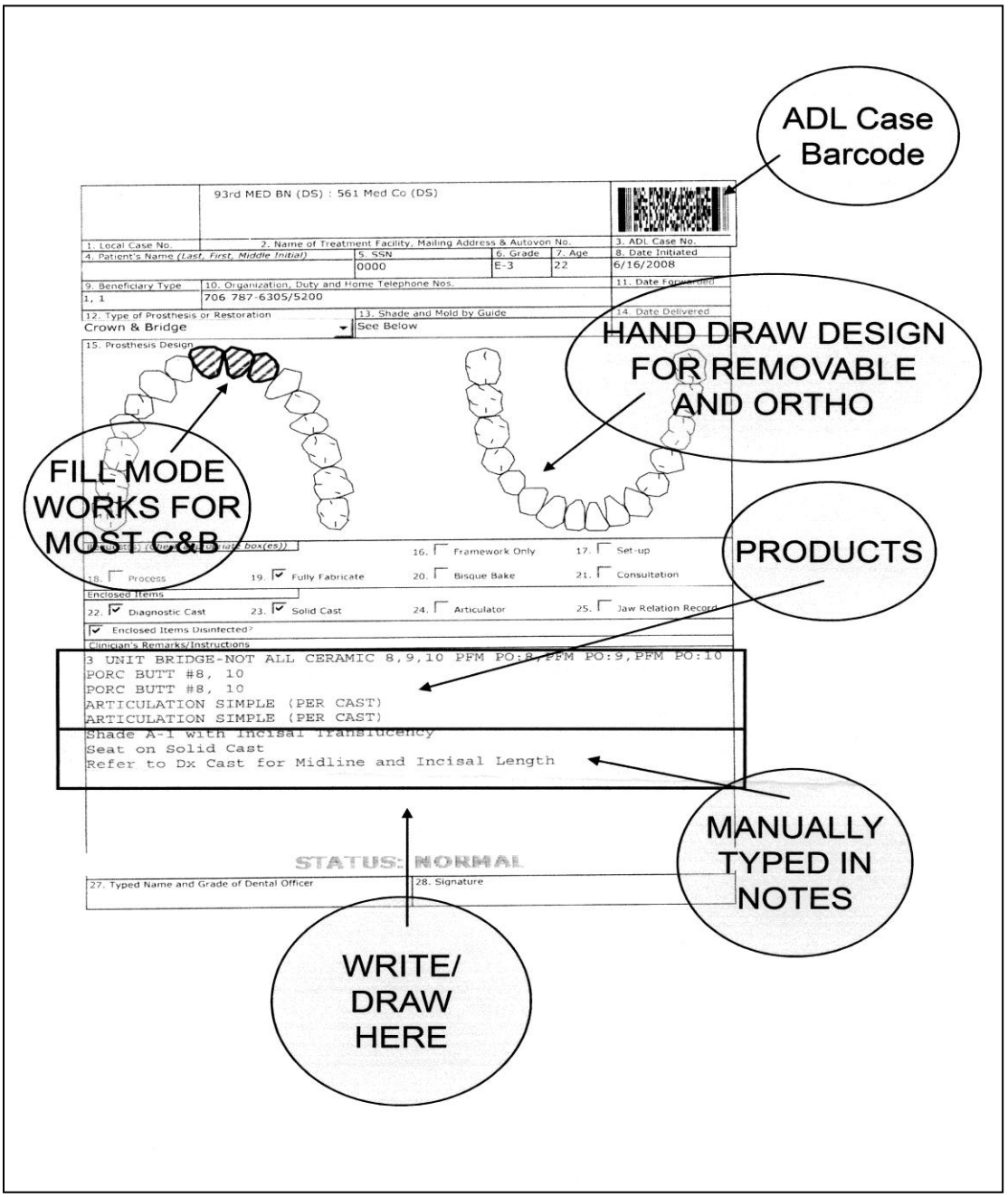



***Figure 2–1. Sample corporate dental application digital 2322***

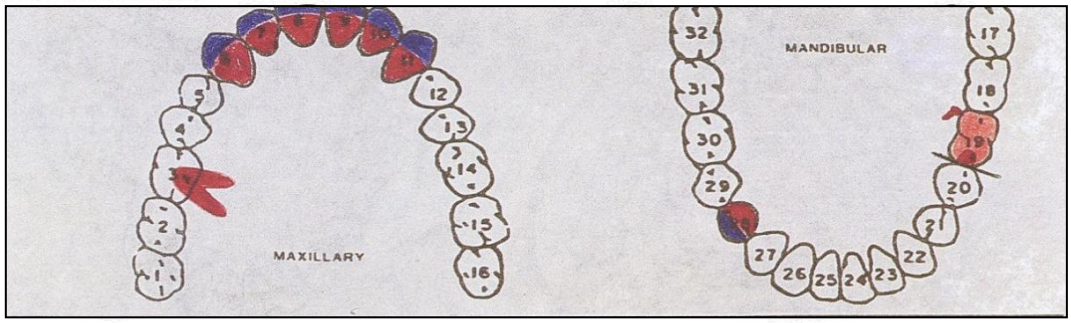
| 1234-5-67 | Stout Dental Clinic<br>USA DENTAC<br>Fort McClellan, AL 36205 865-5555 | | 2-333 |
|---|---|---|---|
| 1. Local Case No. | 2. Name of Treatment Facility, Mailing Address & DSN No. | | 3. ADL Case No. |

| 4. Patient's Name *(Last, First, Middle Initial)* | 5. Grade | 6. Age | 7. Date Initiated |
|---|---|---|---|
| Doe, John B. | E-2 | 26 | 20110601 |

| 8. Beneficiary Type | 9. Organization, Duty and Home Telephone Nos. | 10. Date Forwarded |
|---|---|---|
| 5-1 | K-9 Co., MP School 865-2530 | 20110603 |

| 11. Type of Prosthesis or Restoration | 12. Shade and Mold by Guide | 13. Date Delivered |
|---|---|---|
| FPD#6-11, Cr#19, 28, Post#3 | Vita A2 See Remarks | |

14. Prosthesis Design




Request(s) *(Check appropriate box(es))*

15. ☐ Framework Only  16. ☐ Set-up

17. ☐ Process  18. ☐ Fully Fabricate  19. ☒ Bisque Bake  20. ☐ Consultation

21. ☒ Diagnostic Casts  22. ☐ Jaw Relation Record  23. ☐ Radiographs  24. ☐ Other *(See remarks)*

25. Clinician's Remarks/Instructions

Copy esthetics of enclosed diagnostic wax up.
Surveyed Cr #19, mesial rest and guide plane, DL ret.
Cast tripoded to RPD path of insertion.
Full Porcelain occlusal #28.
Cast post #3 in base metal alloy.
Shade BF 52 tooth #28.
Do not finish margins.

| 26. Typed Name and Grade of Dental Officer | 27. Signature |
|---|---|
| MAJ John A. Smith, DC | |

**DD Form 2322, APR 2009** **Dental Laboratory Work Authorization**

PREVIOUS EDITION IS OBSOLETE

***Figure 2–2. Sample hardcopy DD Form 2322 for fixed prosthodontics***

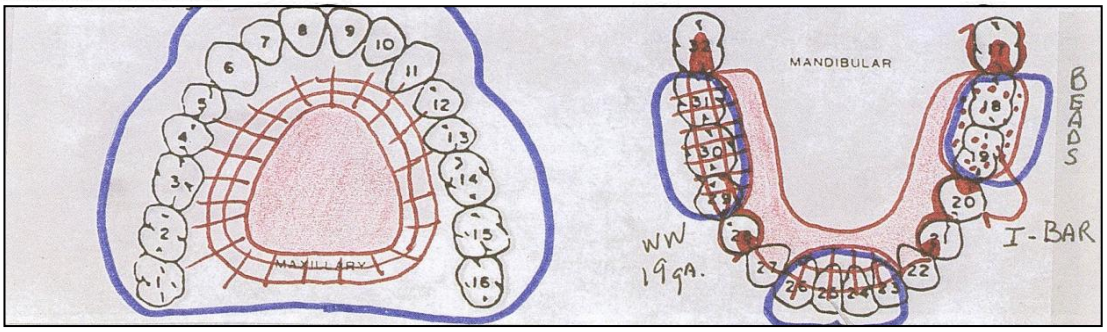
| 1234-56-10 | Dental Clinic #3<br>USA DENTAC<br>Fort Hood, TX 67544-5063 737-6789 | 1-111 |
|---|---|---|
| 1. Local Case No. | 2. Name of Treatment Facility, Mailing Address & DSN No. | 3. ADL Case No. |

| 4. Patient's Name *(Last, First, Middle Initial)* | 5. Grade | 6. Age | 7. Date Initiated |
|---|---|---|---|
| Smith, Jane A. | E-7 | | 20110601 |

| 8. Beneficiary Type | 9. Organization, Duty and Home Telephone Nos. | 10. Date Forwarded |
|---|---|---|
| 1-1 | HQ, Co, 3rd Bn 737-2345 | 20110603 |

| 11. Type of Prosthesis or Restoration | 12. Shade and Mold by Guide | 13. Date Delivered |
|---|---|---|
| Max Cast Base, Man RPD | Bioblend 106,H,33M65 | |

14. Prosthesis Design




Request(s) *(Check appropriate box(es))* 15. ☐ Framework Only 16. ☐ Set-up

17. ☐ Process 18. ☐ Fully Fabricate 19. ☐ Bisque Bake 20. ☐ Consultation

21. ☐ Diagnostic Casts 22. ☐ Jaw Relation Record 23. ☐ Radiographs 24. ☐ Other *(See remarks)*

25. Clinician's Remarks/Instructions

Set teeth in cross bite at left.
Extra relief over mandibular tori.

| 26. Typed Name and Grade of Dental Officer | 27. Signature |
|---|---|
| LTC John A. Doe, DC | |

**DD Form 2322, APR 2009** **Dental Laboratory Work Authorization**

PREVIOUS EDITION IS OBSOLETE

***Figure 2–3. Sample hardcopy DD Form 2322 for removable prosthodontics***

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# CHAPTER 3

# OPERATIONS

## 3–1. Clinical considerations

Pre-treatment aids, including full mouth radiographs and diagnostic casts, should be used to determine the final treatment plan for each patient to receive prosthodontic care. Modifying considerations such as patient status, time available to complete treatment, and patient interest as well as ability to perform required oral health maintenance procedures must be recognized.

*a*. Abutment selection for fixed dental prostheses should follow accepted guidelines and provide adequate support for the intended prosthesis. The use of cantilever-fixed dental prostheses should be carefully evaluated.

*b*. Intra-coronal retainers (inlays) are undesirable abutments for fixed dental prostheses.

*c.* Fixed restorations of eight or more units or requests for restorations using commercially designed attachments, unless submitted by a trained prosthodontist, will be referred to the USADL for consultation prior to tooth preparation.

*d.* All ceramic restorations are generally not indicated for teeth posterior to the second premolar.

*e.* Resin-bonded prosthodontic restorations should be limited to anterior restorations, orthodontic retainers, or periodontal splints.

*f.* Guidance by the clinician is necessary in order for the USADL to achieve proper esthetic results. The use of a diagnostic wax-up; casts showing previous esthetically acceptable prostheses; photographs; or other methods of communicating tooth form, size, shade, and arrangement are encouraged.

*g.* A prosthodontic restoration is not indicated unless a significant improvement in mastication can be achieved, esthetics improved, or movement of the remaining teeth prevented. Individual crowns and fixed restorations involving teeth of little or no esthetic significance are more serviceable if they are not veneered with porcelain.

## 3–2. Fixed dental prostheses, crowns, and dies

To assist the USADL in fabricating the requested replacement, the following procedures must be followed:

*a.* All master and opposing casts must be poured in improved stone. Opposing casts must be included in all instances.

*b*. Dies must be fabricated of die stone, and undercuts must be blocked out by the submitting clinician.

*c.* When separating the die from the cast, as much of the edentulous ridge as possible must be kept intact. This facilitates the proximal contouring of restorations in relation to the edentulous ridge and gingival sulcus of the abutment tooth.

*d*. To ensure accurate seating without rotation, dies must be constructed with dowel pins and indexed, or with some other die and tray system.

*e.* To facilitate removal of dies, the dowel pins should be parallel to each other and their apices exposed through the base of the cast and the articulator mounting.

*f.* Each die must have definite margins; the die must be accurately trimmed to the gingival margins and the margins lightly outlined with non-indelible **RED** colored pencil.

*g.* Occlusal registrations must provide accurate articulation and should be trimmed of excess material. Registrations must be stable enough to withstand shipment. Rigid vinyl polysiloxane is the preferred material.

*h.* Wax patterns must be invested prior to sending them to the USADL for casting. A notation as to the amount and type of metal required for casting must be included. The submission of wax patterns is not encouraged and should only be used in an emergency situation.

*i.* The prescription should provide the technician with specific instructions as to type and position of crowns and pontics. Diagnostic casts, sketches, and photos are helpful supplements to the prescription for extensive anterior restorations. Esthetic guides (such as a diagnostic cast with neatly set denture teeth of the desired shape, contour, and positioning) facilitates the laboratory technician's task and assures predictable esthetic results.

*j.* Shade selection for fixed ceramic restorations must be made from current standard shade guides commercially available from the appropriate manufacturer (Vita Lumin®, VitaPan®, 3D Master®, Ivoclar Chromoscop®). Do not utilize a resin shade guide for requesting porcelain. (Vita Lumin®, VitaPan® 3D Master® are registered trademarks of Vita Zahnfabrik H. Rauger GmbH & Co., Germany; Chromoscop® is a registered trademark of Ivoclar Vivadent, Inc.)

*k.* If the clinician desires the use of die spacer or sealer (cyanoacrylate), it must be placed prior to sending the case to the USADL.

*l.* If the clinician desires a porcelain-butt margin on a ceramometal unit, the preparation must demonstrate a definite shoulder of no more than 135-degree slope and have an axial reduction of 1.0–1.5 millimeter (mm).

*m.* All-ceramic, full coverage preparations (e.g., LAVA™, Empress®) must demonstrate a circumferential chamfer margin with 1.0–1.5 mm of axial reduction and 2.0 mm of incisal/occlusal reduction (see Appendix D). (LAVA™ is a trademark of 3M; Empress® is a registered trademark of Ivoclar Vivadent, Inc.)

*n.* Ceramic veneer preparations must demonstrate incisal reduction of 1.0–1.5 mm, uniform facial reduction of 0.6–0.8 mm, and smooth chamfer margins. The master cast must include individually removable dies with the margins exposed and marked in **RED**.
Margins should be sealed with cyanoacrylate. Use of die spacer is optional.

*o.* Preparations for Sculpture/FibreKor® restorations must provide a channel 2x2x2 mm in depth, width, and length to accommodate the fibers of the framework. (Sculpture/FibreKor® is a registered trademark of Pentron Clinical Technologies, LLC.)

*p.* Casts for fixed dental prostheses or individual crowns that require surveying must be tripoded by the clinician to indicate the path of insertion. A design of the future partial should be included with the case.

*q.* A solid cast should be provided for all cases to allow more precise finishing of the proximal contacts and fit of fixed dental prostheses. The solid cast must be poured in the same diestone as the working dies.

### 3–3. Removable prostheses

*a*. *Mouth preparation*. Mouth preparation is essential for the success of any removable dental prosthesis. Certain principles of mouth preparation must be considered for each type of restoration.

(1) *Complete dentures*. Some casts sent to the USADL for the construction of dentures show evidence of unusual tissue conditions which raise questions as to the need for tissue conditioning or correction. An explanation of these conditions, placed in the "Clinician's Remarks/Instructions" section of the digital CDA Form 2322, is necessary to guide technical procedures.

(2) *RDPs*. Mouth preparations for RDPs necessitate the following considerations, many of which can only be appreciated by occluding the diagnostic casts and analyzing them with a dental surveyor:

*(a)* Irregularities of the occlusal plane, which should be corrected by occlusal equilibration, extraction of the offending teeth, the insertion of onlays or crowns, and so forth.

*(b)* Disharmonies of occlusion.

*(c)* Lack of sufficient interocclusal space—

*1*. For denture bases and artificial teeth.

*2*. For rests, indirect retainers, connectors and clasp arms. A minimum clearance of 1 mm must be provided in all tooth-contacting relations for occlusal, incisal, and cingulum rests as well as indirect retainers. Sufficient space must also be made for the metal that connects the rest to the remainder of the prosthesis. When the anterior palatal tissues are to be covered by metal, a clearance of 1 mm is necessary between the incisal edges of lower anterior teeth and the palatal tissues. When clasp arms cross over incisal or occlusal surfaces, as with embrasure or crib clasps, a cross-sectional space of 1.5 mm is required at the embrasure for *each* clasp in all occluding relations.

*(d)* Recontouring of tooth surfaces may be indicated for the following reasons:

*1*. To parallel surfaces, which provide the guiding planes that direct the path of insertion and removal.

*2*. To minimize undesirable undercut areas and unhygienic or unesthetic spaces.

*3*. To reposition heights of contour that are unfavorably close to the occlusal surfaces or incisal edges and do not permit proper clasping.

*4*. To create or position areas favorable for retention, which may necessitate the placing of a restoration.

*5*. To permit the positioning of major connectors in proper relation to the lingual tissues.

*6*. To minimize pits and fissures (the corresponding tooth surface may require smoothing when RDPs are to include occlusal or incisal onlays).

*7*. To improve esthetic results (recontouring the proximal surfaces of teeth adjacent to edentulous spaces facilitates the use of appropriate artificial teeth and minimizes unsightly spaces gingival to the contact points; recontouring to reposition heights of contour in a gingival direction may minimize the display of clasp arms).

*(e)* The occlusal rest form—

*1*. Should cover one-third of the faciolingual width of the occlusal surface.

*2.* Should extend toward the center of the occlusal surface a distance comparable to its width.

*3.* Should be spoon shaped. The floor of the preparation should be spoon shaped, without undercuts, and basically at right angles to the long axis of the tooth with a slight deepening toward the center of the tooth.

*4.* Should be well rounded. The cavo-surface outline should be well rounded to include rounding of the marginal ridge. Sharp angles and box formations are contraindicated because they induce destructive torques and interfere with the seating of the framework.

*(f)* The incisal rest form—

*1.* The floor should be basically at a right angle to the long axis of the tooth, with a slight deepening toward its center.

*2.* The depth and width of the rest preparation should be such as to provide an adequate bulk of metal in all occluding relations.

*3.* All angles and surfaces must be rounded.

*(g)* The cingulum rest form—

*1.* The cingulum rest is the one of choice on maxillary anterior teeth when occlusion, tooth bulk, and space permit. It is used most advantageously on maxillary canines.

*2.* The preparation should follow the outline of the cingulum, and the floor should be slightly inclined toward the center of the tooth.

*3.* A tooth with an inadequate cingulum may require the construction of a crown, onlay, resin-bonded onlay into which the cingulum rest is prepared.

*4.* If a lingual rest is desired on a mandibular anterior tooth or when the occlusion does not permit a cingulum rest on a maxillary anterior tooth, a lingual shoulder may be prepared in the enamel at or below the cingulum. These preparations should be rounded and smooth.

*(h)* Every tooth surface that has been modified must be polished.

*(i)* Teeth with short clinical crowns may require periodontal surgery to expose more surface for the proper placement of minor connectors, rests, or clasp arms.

*b. Rotational-path type RDPs*. There is a difference between a dual-path RDP and a rotational-path RDP. A dual-path RDP is one in which there is a combination slide and rotational path of insertion; a rotational-path RDP is one in which there is only a rotational path of insertion. To construct rotational path-type RDPs, the USADL must receive a completed Digital CDA Form 2322 with all pertinent comments and the following:

(1) *Dual-path RDP*. A master cast with two sets of tripod marks drawn on the cast. The first set of tripod marks should be circled with a red wax pencil and indicate the initial and conventional survey of the cast. The second set of tripod marks should be circled with a blue wax pencil. These tripod marks indicate the tilt of the cast to be used when blocking out the area of the master cast to receive the rigid retentive portion of the RDP. The following considerations should be kept in mind when contemplating a dual-path-type RDP:

*(a)* Occasionally, a clinician will state on the digital or hardcopy CDA Form 2322, "do not blockout the mesial of #6 and #11, make a dual-path RDP." When evaluating the area of the cast to receive the rigid retention, unless all undercuts can be eliminated when tilting the cast back, blockout will be necessary in that area.

*(b)* Bead retention is not indicated in the anterior edentulous area.

*(c)* A patient with a high or deep palatal vault may be unable to rotate the RDP into final resting position.

*(d)* The conventional clasps used on posterior teeth should have the clasp tips pointed towards the distal, not towards the mesial.

*(e)* The rotational-type RDP should be limited to totally tooth-borne cases.

*(f)* This type RDP is best used on Kennedy Class IV patients. Modification spaces will, on many occasions, present severe esthetic compromises.

*(g)* Lingual plating is contraindicated.

(2) *Rotational path RDP*. A master cast with one set of tripod marks. The clinician should evaluate critical undercuts and make whatever adjustments are necessary so the USADL does not have to block out the area of rigid retention. The following considerations should be kept in mind when contemplating a rotational type RDP:

*(a)* I-bar retention is contraindicated. The body of these type clasps will invariably interfere with the rotation of the RDP into the final resting position.

*(b)* Lingual plating is contraindicated.

*(c)* Lingually tipped teeth in the path of rotation is a contraindication.

*(d)* The conventional clasps should have their tips pointed away from the rotation of the RDP.

*(e)* The rotational-path type RDP should be limited to totally tooth-borne cases.

*(f)* Long "channel" type asymmetrical rests about 2-mm deep should be used on the teeth that will receive the rigid retention.

*c. Immediate dentures*. To construct immediate dentures, the USADL must receive the following in addition to the master casts and the jaw–relation records:

(1) A duplicate cast of the anterior portion of each arch for which multiple anterior teeth are to be replaced.

(2) Specific instructions either to duplicate/modify the existing tooth form or arrangement.

(3) Requests for surgical templates if they are desired.

(4) Identification of the teeth to be extracted with a red "X" on both the cast and the prescription from which an immediate removable dental prosthesis is to be constructed.

*d. Esthetic guidance*. Whenever anterior teeth are to be replaced, the clinician and patient should agree on the desired results. In order to aid the USADL in achieving this end, the following should be effective in communicating a legally binding prescription:

(1) A cast of an existing-fixed, RDP, or temporary-fixed prosthesis with acceptable esthetics will allow the USADL to establish the desired contours as well as vertical and horizontal overlap.

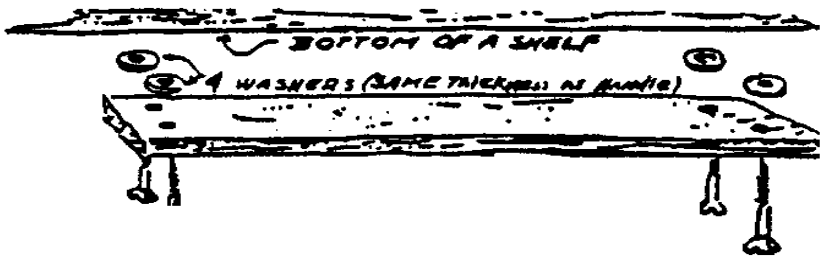
(2) Select and set denture teeth on a wax rim to acceptable results. Make an impression, and pour a cast of the required contours as well as vertical and horizontal overlap.

(3) The RDPs replacing anterior teeth can be enhanced by providing the USADL with the anterior teeth already set in the desired positions. An anterior plaster or poly vinylsiloxane (known as PVS) putty matrix should be made for the setup, plus the adjacent teeth on each side

of the edentulous area. The USADL will be able to cast to these replacement teeth and provide internal metal reinforcement that will greatly enhance both strength and esthetics.

**3–4. Dental casts**

*a. Pouring the cast.* When the impression is removed from the mouth, it should be disinfected immediately. It should then be rinsed with a thin slurry of artificial stone to remove saliva and mucous and then disinfected. The disinfected impression is then poured immediately in artificial stone using the manufacturer's recommended water-powder ratio. When it is impractical to box an impression, the initial pour of stone should cover the peripheral roll. Inverting the impression or placing it on the work bench while the stone is setting can cause distortion. The tray should be supported in a horizontal position by its handle only (see figure 3–1). Rough nodules should be built up on the surface of the initial pour to engage and retain the base portion, which will be poured as a second stage (see figure 3–2). After the first pour has reached its initial set, the impression may be inverted or boxed in order to complete the base.




**WOOD SCREWS 1 ½ inches LONG**

←----------20 INCHES ----------→

***Figure 3–1. Impression tray holder***

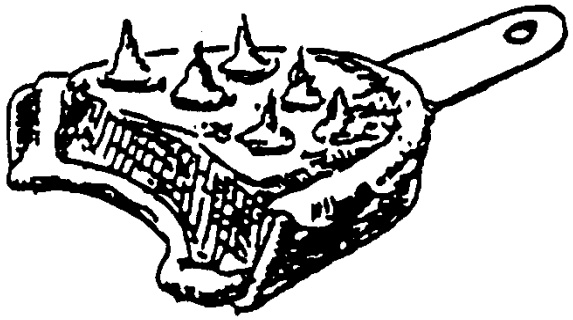


***Figure 3–2. Initial pour***

*b. Requirements for casts*.

(1) Casts must be accurate, neatly trimmed, dense, have a hard surface, and be free of voids and blebs. Correction of minor defects in noncritical areas is the responsibility of the clinician. The occlusal surfaces must be free of imperfections. Defects in critical locations require a new cast. Hand-carving of casts is not acceptable.

(2) Casts must be properly extended to include all areas necessary for denture support. Maxillary casts must indicate a definite posterior border for the prosthesis and display the hamular notches as well as both tuberosities. Mandibular casts must include both retromolar pads.

(3) The base of maxillary casts at the deepest part of the palate must be 15-mm thick. The lingual area of mandibular casts must also be 15-mm thick and be trimmed flat and smooth, yet maintain and preserve the lingual peripheral roll.

(4) The peripheral roll must not exceed 3 mm in depth. It must be fully preserved and protected by a land area or edge extending outward 4 mm from the roll.

(5) All casts submitted for the fabrication of complete or partial removable prostheses must exhibit the following dimensions (see figures 3–3 and 3–4):

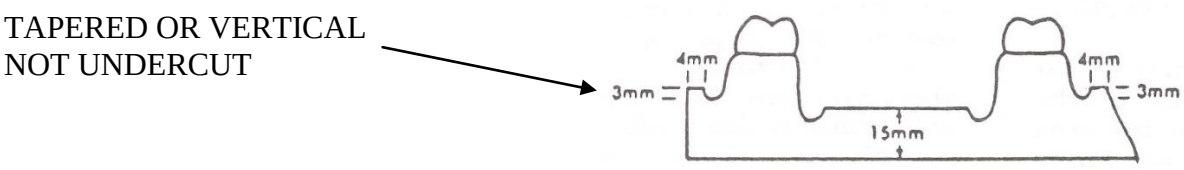



***Figure 3–3. Mandibular cast dimensions***

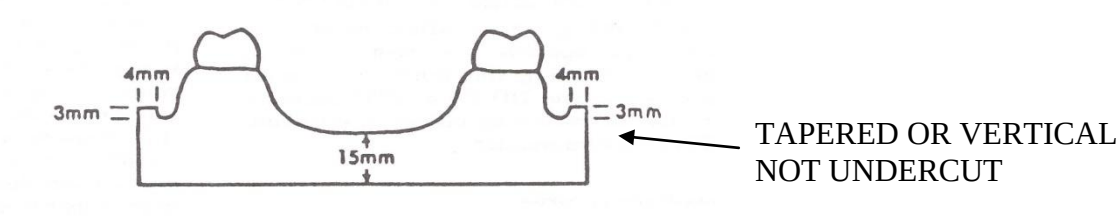
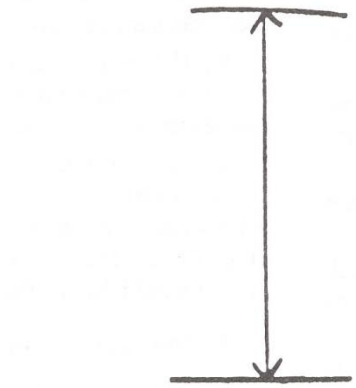
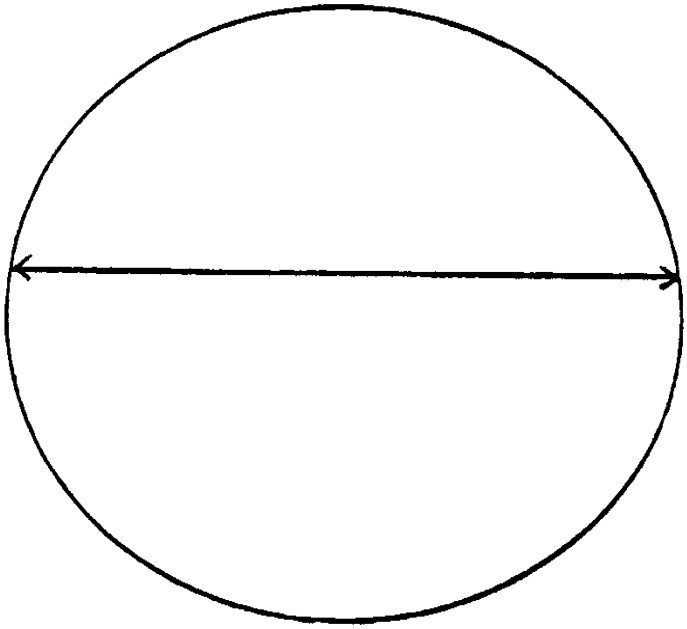



***Figure 3–4. Maxillary cast dimensions***

(6) The side-walls of the base of casts for RDPs must taper outward toward the base to facilitate removal of the cast from the duplicating material. Figure 3–5 should be utilized as a matrix for sizing and trimming of the master cast to a typical duplication flask utilized by the USADL.



*(Thickness available for duplication material.)*



*(Dimension of a typical duplication flask. Larger flasks are available; however, experience has demonstrated greater consistency of correct framework adaptation to master casts when the typical size flask is utilized.)*

***Figure* 3–5. *Typical duplication flask dimensions***

(7) If casts must be wet for any reason, a slurry of set artificial stone should be used. Tap water will leach the surface of casts.

(8) If a posterior palatal seal for a complete maxillary denture or extensive partial denture is not included in the impression technique, the clinician must modify the cast by scraping its surface to create a posterior seal. This seal should be approximately 1½-mm thick at its greatest depth; this is a clinical procedure, not a laboratory procedure.

(9) If a denture is to be constructed to provide relief for sensitive areas, bony prominences, and so forth, the dental officer must outline in green the areas to be relieved on the cast and describe the depth of relief desired.

(10) If the casts are mounted on an articulator that does not support cross mounting between articulators prior to submission to the USADL, the base of the casts must be keyed and lubricated in the key area to permit accurate remounting of the casts. These casts must be removed from the articulator prior to submission, and the articulator must be sent with them.

(11) The submitting dental officer must critically evaluate and approve the casts and all records prior to delegating the work to a dental laboratory technician. The printed copy of the CDA digital DD Form 2322 must be countersigned by the laboratory officer as designated by the DENTAC commander.

**3–5. Interocclusal records**

*a. Fixed prostheses.* If the casts can be unmistakably hand-articulated by means of positive tooth stops in all quadrants, no interocclusal record is required. Vertical grooves must be placed or lines must be drawn from the maxillary to the mandibular tooth surfaces on three widely separated parts of the casts. If the casts cannot be hand-related or if the most distal tooth is prepared in a quadrant, a jaw-relation record (using an accurate nonpressure-recording medium) must be used. The PVS-recording medium is recommended. The record should be trimmed such that only cusp-tip indentations remain.

*b. Complete dentures.* Any technique which provides accurate jaw relationship records may be used. The technique must employ a rigid, stable record base and occlusion rim. The record base may be stabilized with PVS impression material to improve its fit and stability. The occlusion rim may be sealed to the base with sticky wax. The occlusal surface of the maxillary rim must be formed to establish the plane to which the dentist desires the teeth to be set. The facial surfaces of the occlusion rim should be contoured to indicate the desired positions of the artificial teeth and have the mid-line marked. The rims and records must be indexed to permit positive reassembly at the laboratory. To prevent soft-tissue displacement, interocclusal records should be made in a material that is "dead soft" while the relations are recorded. The material must become rigid upon setting and not distort when separated, packed, or shipped.

*c. Removable dental prostheses.* In general, the procedures for recording jaw relationships for RDPs are similar to those described above for complete dentures. If the casts can be related to each other in accurate maximum intercuspation by means of the remaining teeth, vertical connecting lines (orientation marks) may be drawn across the facial surfaces of occluding teeth at widely separated points. When this procedure is not possible, record bases with occlusion rims or well-trimmed plaster or elastomeric records may be used. Opposing teeth must not contact the opposite ridge nor should they penetrate the recording media to contact the hard portion of the occlusion rim or the record base. If the clinician wishes to exclude the opposing cast or occlusal record, the USADL will attempt to properly place and contour the components of

the framework; however, occlusal equilibration will then be the clinician's responsibility. "Mush bites" and "sandwich bites" for packaging and mailing are not acceptable. After the casts have been related to each other with the registration, this relationship should be checked clinically against the patient's natural occlusion. In order to make this comparison, it is necessary to trim the registration so that only the indentations of the tips of the opposing cusps remain. Registrations must not be sealed to each other or to the casts. Approximated casts sealed in this manner are frequently broken during shipment.

**3–6. Communication**

*a. Shipment preparation.* Prior to sending the cast to the USADL, the following must be done:

(1) Indicate the limit of the posterior extension of the maxillary prosthesis by a sharp, black pencil line drawn across the palate. (DO NOT USE INDELIBLE PENCIL.)

(2) On the mandibular cast, mark the limit of the lower border of the major connector with a sharp, black pencil line. (DO NOT USE INDELIBLE PENCIL.)

*b. Orthodontic design.* All dentists are strongly encouraged to draw their RDP or orthodontic design to scale on a duplicate of the master cast utilizing the following color codes:

(1) RED = METAL.

(2) GREEN = RELIEF.

(3) BLUE = RESIN, PORCELAIN, AND/OR WROUGHT WIRE.

**3–7. Artificial teeth**

*a*. Activities not authorized to utilize indefinite quantity contracts may, when necessary, obtain teeth from the USADL for individual cases.

*b*. These requests will be made by properly submitting the digital DD Form 2322 first, then contacting the Customer Service Department via e-mail, facsimile, or phone.

*c*. The digitally submitted DD Form 2322 can be extracted, printed, and mailed to the requesting clinic along with the teeth selected (see para 2–2). Requests must indicate manufacturer, mold, and shade. In selecting the shade, the shade guide specified by the manufacturer must be used for the particular tooth desired. The USADL can be contacted to determine stockage to facilitate the selection process.

# CHAPTER 4

# MISCELLANEOUS ACTIONS

## 4–1. Discrepancies

Some of the more frequent discrepancies observed in cases submitted to the USADL are—

*a. Fixed prosthodontics.*

(1) Excessively tapered tooth preparations or underprepared teeth.

(2) Dies with margins that are rough, obscure, or not outlined.

(3) Dies that are rough, not properly trimmed, or with no positive seat.

(4) Inaccurate and incorrectly trimmed occlusal records.

(5) Failure to provide full-arch casts for posterior fixed dental prostheses.

(6) Failure to provide casts of adequate extension for anterior crowns and FDPs.

(7) Improper tooth preparation for the type of restoration requested. Not enough space between opposing occlusion and prepared tooth for requested prosthesis material.

(8) Lack of adequate esthetic guidance.

(9) Inappropriate margin preparation for product requested; margin shoulder not adequate for porcelain butt margin, beveled margin for collarless restoration, J-prep margin for all-ceramic restoration.

*b. Removable prosthodontics.*

(1) Operative dentistry not completed.

(2) Distortion of hard and soft tissues due to direct tray pressure.

(3) Inadequate preparation of rest seats and guiding planes for removable dental prostheses.

(4) Insufficient inter-ridge distance for artificial teeth and denture bases. Insufficient clearance for occlusal, incisal, and cingulum rests.

(5) Improperly trimmed or underextended casts.

(6) Insufficient buccal and/or lingual vestibular depth for resin or clasp placement.

(7) Casts showing evidence of—

*(a)* Calculus deposits or debris on the teeth.

*(b)* Distortions due to either the premature removal of the impression or impression material sticking to the teeth.

*(c)* Hand-carving to correct defective tooth or tissue contours.

*(d)* Voids; blebs; and rough, porous, or chalky surfaces.

*(e)* Talcum, dirt, petroleum jelly, slurry, cyanoacrylate, and so forth.

(8) Unstable record bases and improper or untrimmed occlusal registrations.

(9) The RDP designs drawn on master casts without authorization.

(10) Failure to remove undercuts from the denture before making an impression for rebase or reline.

(11) Broken and distorted occlusal registrations resulting from poor packing.

**4–2. Other requests**

*a*. Requests for all miscellaneous prostheses (such as mouth protectors, periodontal splints, and surgical splints) must be given the same careful attention as that accorded any other dental prosthesis. Requests will include accurate casts, treatment plan, diagram of the design, and the desired materials. In many instances, occlusal registration records and a description of the overall treatment plan are necessary.

*b.* To repair fractured dentures, positive repositioning of the parts is essential. Complete dentures often require a plaster or stone matrix to hold the parts in accurate relation. Partial denture repairs usually require a cast made from an impression with the denture accurately seated in the mouth. If the impression is made with the denture out of the mouth, the denture usually will not fit the cast. If teeth or clasps are to be added to dentures, an opposing cast is necessary when occlusal relations are involved.

*c.* Before making the impression for relining or rebasing, all of the undercuts must be removed from the tissue surface of the denture base. This is to permit separation of the denture from the cast during the laboratory procedures.

*d*. The selection of dental casting alloys used for patient restorations will be based on properties relevant to a particular use of the material and cost containment. Dentists providing treatment may prescribe the type of alloy (generic) that will best fulfill the needs of individual patients. If the USADL cannot provide a restoration with an alloy (generic) that satisfies the dentists' request, a laboratory will try to be located with the capability of filling the prescription.

**4–3. Packaging and mailing**

*a.* All items sent to the USADL must be disinfected. Disinfect impressions, jaw relation indices, bite rims, and so forth, with an appropriate product. Casts should be dry as moisture can effect growth of organisms on the casts during shipment. A potential incubator effect during periods of high temperature may contribute to the growth. After being allowed to dry, the casts, bite rims, and so forth, must be wrapped in a plastic bag prior to placing them in packing boxes.

*b*. Casts should be placed in a foam protector, back-to-back, and shipped in a standard mail carton.

*c*. Occlusion rims should be placed on the casts.

*d.* Dies must be removed from the casts and packed separately.

*e*. Occlusal indices must be wrapped separately.

*f*. A signed copy of DD Form 2322 must be included with the case. The mailing box should be wrapped in postal wrapping paper and sealed with tape. By not taping the mailing box directly, the service life of mailing boxes is greatly extended.

*g*. Federal Express (FedEx®) shipping within the contiguous United States (CONUS). (FedEx® is a registered trademark of FedEx Corporation.)

(1) Within CONUS, cases are sent to the USADL at Fort Gordon via FedEx using the billing account assigned to the USADL. Cases can only be sent to the Fort Gordon facility. A FedEx Airbill must be properly completed for each CONUS shipment. The shipping address and account number must be the same. Airbills are available from FedEx.

(2) Shipments should be consolidated into larger packages or packages taped together. The FedEx shipping rates make it more economical to ship larger and heavier packages vs. single case boxes. It will also result in fewer Airbills being generated.

*h.* FedEx shipping outside the contiguous United States (OCONUS).

(1) The OCONUS laboratory cases are sent to the USADL at Fort Gordon via FedEx using the billing account assigned to the USADL (see figure 4–1). Cases can only be sent to the Fort Gordon facility. Shipments require a FedEx International Airbill and Commercial Invoice and cannot be more than 10x10x10 inches. The shipping address and account number must be the same. Airbills and commercial invoices are available from FedEx.

(2) Shipments should be consolidated into larger packages or packages taped together as for CONUS shipments.

(3) All local and international laws regarding mail shipments must be followed.

*i.* It is recommended that each submitting facility maintain a mailing log of cases sent to the USADL which identifies the case by name, clinician, prosthesis type, FedEx tracking number, date mailed, date returned, and date delivered to the patient. This will provide the command with an excellent history of prosthetic treatment as well as time requirements needed to accomplish the average prosthodontic case.

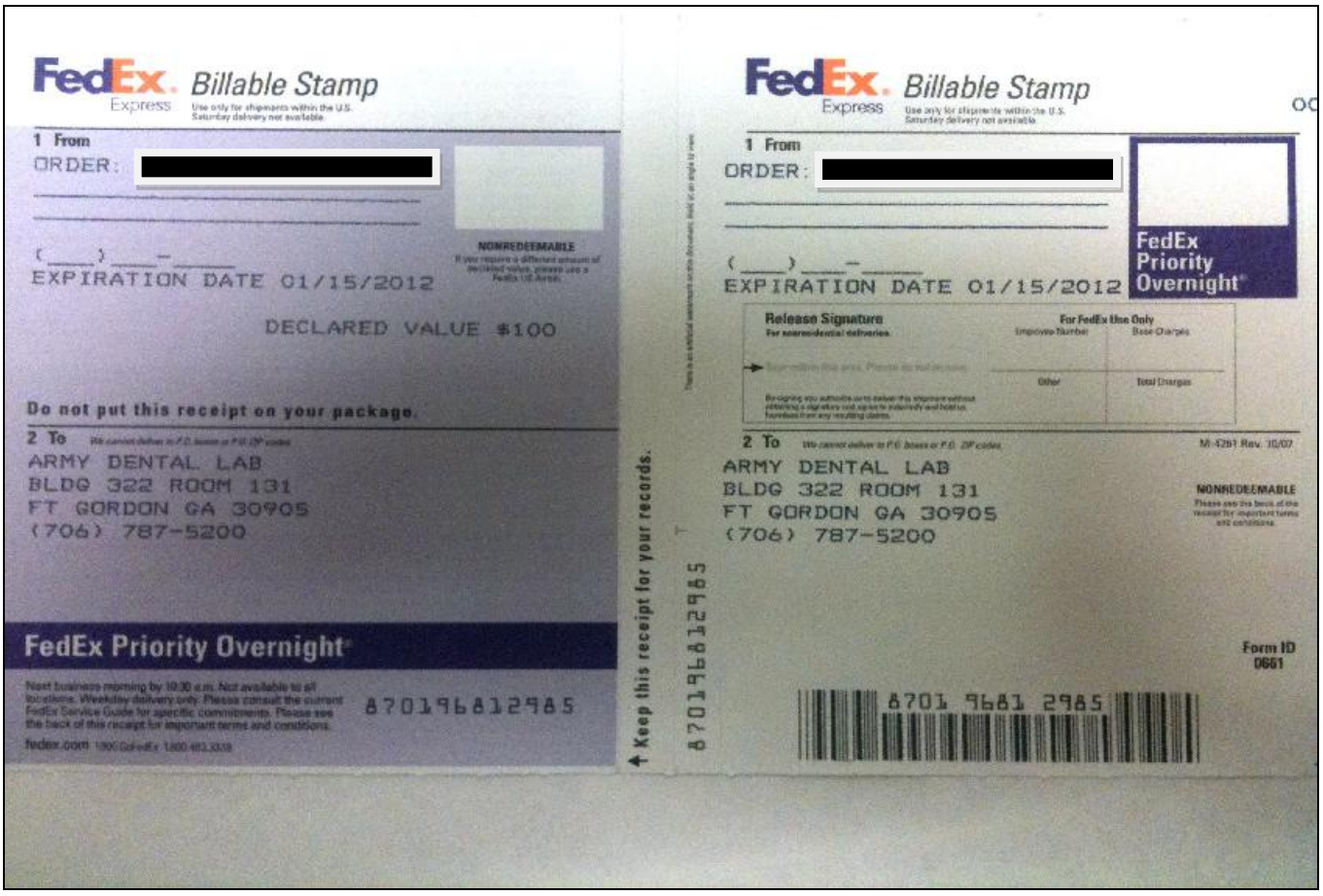



*Figure 4–1. Sample billable stamp*

# APPENDIX A

## REFERENCES

**Section I**
**Referenced Publications**

**AR 40-3**
Medical, Dental, and Veterinary Care

**AR 40-66**
Medical Record Administration and Health Care Documentation

**Technical Bulletin, Medical 250**
Dental Record Administration, Recording, and Appointment Control

**Section II**
**Forms**

**DD 2322**
Dental Laboratory Work Authorization

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# APPENDIX B

## LABORATORY PRODUCT LIST

### B–1. General
Dental officers electronically complete and submit DD Form 2322 in the CDA.

### B–2. Sample laboratory products list
Figure B–1 is a list of laboratory products found in the dropdown menu for Product Group. The appropriate product(s) should be entered in the Clinicians Remarks/Instructions section of the digital DD Form 2322.

3x3
3 Unit Full Metal or PFM FDP
4 Unit Full Metal or PFM FDP
5 Unit Full Metal or PFM FDP
6 Unit Full Metal or PFM FDP
7 Unit Full Metal or PFM FDP
8 Unit Full Metal or PFM FDP
9 Unit Full Metal or PFM FDP
10 Unit Full Metal or PFM FDP

Acrylic Resin Model Demonstration Education
Acrylic Resin Repairs and Modification
Additional Master Dies (One for Each Additional Die)
Altered Cast Technique
Articulation Dual Arch Technique (Triple Tray)
Articulation Fully Adjustable (Each Cast)
Articulation Semi-Adjustable (Each Cast)
Articulation Simple (Each Cast)

Band and Loop
Basic Orthopedic Appliance
Bite Plane Appliance
Bleaching Tray
Block-out Cast to Remove Undercuts

***Figure B–1. Sample of laboratory products***

Blue Grass Appliance
Box and Pour

Cast RDP Framework
Cast Rework (Each Cast)
Casting Only
Cetlin and Springs
Characterized Denture Base
Clark Twin Block
Connecting Bar for Attachment (Implant or Natural Tooth)
Crown and Bridge Metal Occlusion
Crown and Bridge Opaque
Crown and Bridge Porcelain
Crown and Bridge Wax
Crown and Bridge Polish
Custom Tray

Diagnostic Set-Up
Diagnostic Wax-Up Fixed (Per Unit)
Die Spacer/Hardener
Disinfection Procedure
Duplicate Cast
Duplicate Denture

Empress Crown – Layering
Empress Crown – Staining
Empress Inlay/Onlay – Staining
Empress Staining Porcelain
Empress Veneer – Layering
Empress Veneer – Staining
Empress Wax
Empress Layering Porcelain
Encode Abutment Titanium
Encode Abutment Titanium Nitride-coated (Gold Colored)
Encode Abutment Zirconia
Equipment Preventive Maintenance (Each 6 Min)
Essix Retainer
Etching Porcelain
Extra Credit

***Figure B–1. Sample of laboratory products (continued)***

Final Trimming Dies
Final Wax-up Complete Denture
Finish and Polish Complete Denture
Finish and Polish RDP
Fixed Diagnostic Wax-Up per Unit
Fixed Master Cast One Die
Flexible RDP Finish and Polish (Simple)
Flexible RDP Finish and polish (Complex)
Flexible RDP Repair (Non-Injection Method)
Flexible RDP Complex 4 or > Teeth
Flexible RDP Simple 3 or < Teeth
Flexible RDP Set-Up and Injecting (Complex)
Flexible RDP Set-Up and Injecting (Simple)
Full Metal Crown Polish
Full metal Crown Wax
Full Metal Crown Type III
Fully Fabricated PFM PO
Fully Fabricated Complete Denture Balanced Occlusion
Fully Fabricated Complete Denture Non-Balanced Occlusion
Functional Orthodontic Appliance

Habit/Nance Appliance
Habit/Nance Appliance Resin
Habit Appliance No Acrylic
Hard-Soft Mouthguard
Hawley
Hyrax

Implant Cast Custom Abutment UCLA
Implant Custom Abutment Titanium
Implant Custom Abutment Zirconia
Implant Hybrid Framework
Inlays/Onlays Metal Wax
Interim RDP Auto/Light Complex 4 or > Teeth
Interim RDP Auto/Light Simple 3 or < Teeth
Interim RDP Heat-Cured Complex 4 or > Teeth
Interim RDP Heat-Cured Simple 3 or < Teeth
Issue Teeth
Issue Teeth 1x6 Lower
Issue Teeth 1x6 Upper

***Figure B–1. Sample of laboratory products (continued)***

Issue Teeth 1x8 Lower
Issue Teeth 1x8 Upper
Issue/Receive Gold

Lab Processed Composite Crown
Lab Processed Composite FDP Wing Retainer
Lab Processed Composite Pontic
Laser Welding (Each 6 Mins.)
Lava Core
Lava Crown
Lave Core Scan and Design
Lava Milling
Lava Pontic
Lava Sinter
Lava Trim Die
Lip Bumper Appliance
LLA

Maintain Precious Metal Register
Modification Attachments for Ortho Appliances
Mouth Guard /Flex
Multiple Single full Metal or PFM Crowns

Nance
Nance Appliance
Nance Resin

Obstructive Sleep Apnea Device TAP
Occlusal Device (Nightguard Hard)
Occlusal Relation Stone Straps
Ortho Study Models (Per Set)

Pontic for Resin-Retained FDP
Porcelain Butt Margin
Porcelain/Resin Application Only
Post and Core Cast Only
Post and Core Fully Fabricated
Pour Cast
Precision/Semi-precision Attachment Female
Precision/Semi-precision Attachment Male

***Figure B–1. Sample of laboratory products (continued)***

Process Only Denture (Heat Cured)
Processing RDP (Heat Cured)

Quad Helix
Quality Control

RAP Resin Tooth
Rebase Denture (Heat-Cured)
Rebase RDP (Heat-Cured)
Rebase RDP Auto/Light
Record Occlusion Rim Denture
Record Occlusion Rim RDP
Reduction Coping Indirect
Reinforced Polycarbonate FDP
Reline Denture Auto/Light or Heat Cured
Reline RDP (Heat-Cured)
Reline RDP Auto/Light
Remount and Equilibration Denture or RDP
Remount Casts Complete Denture
Removable Orthodontic Expansion Appliance
Repair Case (Use Special Projects)
Repolishing
Resin Repairs and Modifications
Return for Die Trim
RPE 2 Bands Appliance
RPE 2 Bands Resin
RPE 4 Bands Appliance
RTS (Return To Sender)

Seating Core
Set any Tooth or Rap Resin Tooth
Set-Up Denture Balanced Occlusion
Set-Up Denture Non-Balanced Occlusion
Set-Up RDP Balanced Occlusion
Set-Up RDP Non-Balanced Occlusion
Single Full Metal Crown or PFM Crown
Sleep Apnea Appliance Thornton Adjustable Positioner (TAP®)/TAP-Nickel Free (NF)/TAP 3 (TAP® is a registered trademark of Airway Management, Inc.)
Soft Denture Liner (Heat Process)
Soft Tissue Cast

***Figure B–1. Sample of laboratory products (continued)***

Soldered Appliance Complex
Soldered Appliance Simple
Solder Investment
Solder Non-Investment
Special Projects (Per 6 Mins)
Spring Retainer
Spring Retainer Resin
Stain and Glaze
Staining and Glazing
Stumpf Die (Empress)
Surgical Stent Heat
Surgical Stent Vacuum or Pressure Molded
Surgical Stent/Implant Autopolymerizing or Light Cured

Test
Test 2
Tooth Index
Transpalatal Arch
Trimming Only- Orthodontic Study Casts
Type III Inlay/Onlay

Unpacking and/or Packing

Veneer Lost Wax Lab

Wax and Cast Metal Substructure Only
Wax/Porcelain
Wing Retainer Resin-Retained FDP
Wing Retainer Resin-Retained FDP Wax
Wrought Wire (One for Each Wire)

***Figure B–1. Sample of laboratory products (continued)***

# APPENDIX C

# LABORATORY VALUES AND CODES

## C–1. General

The laboratory values and codes will be used when performing any of the procedures listed below in the dental laboratory or operatory.

## C–2. Composite laboratory values and codes list

Table C–1 indicates the laboratory values and codes used by the dental laboratory technician and dental officers to receive credit for work completed.

**Table C–1. Composite laboratory values and codes**

| Code | | CLV |
|---|---|---|
| | **001–099, GENERAL PROCEDURES** | |
| 00001 | Disinfection Procedure | 1 |
| 00002 | Unpacking and/or Packing Case | 1 |
| 00003 | Pour Cast; Preliminary, Master, Opposing, or Remount | 2 |
| 00004 | Impression Tray, custom | 4 |
| 00005 | Issue Prosthodontic Teeth | 1 |
| 00006 | Quality control | 1 |
| 00007 | Technical Consult | 1 |
| 00008 | Articulation, Fully Adjustable | 2 |
| 00009 | Articulation, Semi-Adjustable | 2 |
| 00010 | Articulation, Simple | 1 |
| 00011 | Cast Rework/Quality Control Corrections | 1 |
| 00012 | Laser Welding | 1 |
| 00013 | Soldering, Procedures, Investment Technique | 4 |
| 00014 | Soldering, Non-Investment Technique | 2 |
| 00015 | Acrylic Resin Repairs and Modification | 5 |
| 00016 | Repolishing | 2 |
| 00017 | Box and Pour | 5 |
| 00018 | Duplicate Cast | 2 |
| 00019 | Equipment Preventive Maintenance | 1 |
| 00020 | Special Projects | * |
| | **100–199, ORTHODONTIC AND SPECIAL APPLIANCES** | |
| 00104 | Trimming Only Orthodontic Study Cases | 6 |
| 00105 | Orthodontic Study Casts | 8 |
| 00106 | Diagnostic Set-up | 10 |
| 00107 | Basic Orthopedic Appliance | 20 |
| 00108 | Hawley Appliance Simple | 15 |
| 00109 | Modification Attachments for Hawley and Expansion Appliances | 2 |
| 00110 | Functional Orthodontic Appliance | 30 |
| 00111 | Orthodontic Tooth Positioner | 5 |
| 00112 | Removable Orthodontic Expansion Appliance | 15 |
| 00113 | Mouth guard, Flexible, Athletic or Pressure or Vacuum-formed Nightguard Non-Occluded | 40 |

**Table C–1. Composite laboratory values and codes (continued)**

| Code | | CLV |
|---|---|---|
| 00114 | Fluoride-Carrier, Bleaching Tray | 5 |
| 00115 | Occlusal Device, "Nightguard" | 25 |
| 00116 | Obstructive Sleep Apnea Device | 40 |
| 00117 | Soldered Appliance, Complex | 24 |
| 00118 | Soldered Appliance, Simple | 28 |
| **Code** | | **CLV** |
| | **200–299, COMPLETE DENTURES** | |
| 00206 | Surgical Stent/Implant Radiographic Template Auto-polymerizing or Light-Cured Resin | 20 |
| 00207 | Surgical Stent, Vacuum- or Pressure-Molded | 4 |
| 00208 | Reline Complete Denture, Auto-polymerizing, Light-Cured Resin, or Heat-Cured Resin | 20 |
| 00209 | Rebase Complete Denture | 25 |
| 00210 | Record Base and Occlusion Rim, complete Denture | 15 |
| 00211 | Set-up, Complete Denture, Balanced Occlusion | 26 |
| 00212 | Set-up, complete Denture, Non-Balanced Occlusion | 18 |
| 00213 | Final Wax-Up, Complete Denture | 5 |
| 00214 | Process Only, Complete Denture, Heat-Cured | 5 |
| 00215 | Characterized Denture Base | 2 |
| 00216 | Precision/Semi-Precision Attachment, Overdenture | 10 |
| 00217 | Remount and Equilibration of Processed Dentures | 7 |
| 00218 | Remount Casts, Complete Dentures | 2 |
| 00219 | Finish and Polish Complete Denture | 10 |
| 00220 | Fully Fabricated Complete Denture, Balanced Occlusion | 70 |
| 00221 | Fully Fabricated Complete, Denture, Non-Balanced Occlusion | 58 |
| 00222 | Duplicate Complete Denture | 20 |
| 00223 | Acrylic Resin Model, Demonstration, Education | 15 |
| 00225 | Soft Denture Liner (heat process) | 14 |
| | **300–399, FIXED** | |
| 00302 | Fixed Master Case, Implant Analog(s) | 2 |
| 00303 | Soft Tissue Reproduction-Fixed pros cast | 2 |
| 00304 | Fixed Master Cast, One Die | 10 |
| 00305 | Additional Master Dies | 1 |
| 00306 | Final Trimming Master Die | 2 |
| 00308 | Die Spacer/Hardener | 1 |
| 00312 | Articulation, Dual Arch Technique (Triple Tray) | 12 |
| 00313 | Diagnostic Wax-up, Fixed | 3 |
| 00314 | Issue/Receive Gold and Maintain Precious Metal Registers | 2 |
| 00315 | Casting Only, Fixed | 2 |
| 00316 | Fully Fabricated All-Metal Crown or Fixed Dental Prosthesis | 20 |
| 00317 | Inlays/Onlays, Metal | 17 |
| 00318 | Post/Core, Indirect | 7 |
| 00319 | Post/core, Direct | 2 |
| 00320 | Cast metal Substructures Only, Crown or FDP Retainer | 15 |
| 00321 | Fully Fabricated Porcelain Fused to Metal Crown or FDP Retainer | 25 |
| 00322 | Porcelain Margin | 5 |
| 00323 | Metal Occlusion | 4 |
| 00324 | Porcelain/Resin Applications Only | 10 |

**Table C–1. Composite laboratory values and codes (continued)**

| Code | | CLV |
|---|---|---|
| 00325 | Staining and Glazing | 3 |
| 00329 | Implant, Custom Abutment | 15 |
| 00330 | Screw-Retained Implant Restoration | 20 |
| 00331 | Pre-Manufactured Abutment Preparation/Modification | 5 |
| 00332 | Precision/Semi-Precision Attachment | 5 |
| 00333 | Connecting Bar for Attachment Implant or Natural Tooth Abutment | 12 |
| 00334 | Implant Framework | 70 |
| 00335 | Surveyed Crown | 2 |
| 00336 | Surface Milling of Fixed Restoration | 5 |
| 00337 | Wing, Resin Retained Fixed Dental Prosthesis | 12 |
| 00338 | Provisional Restoration or Reduction Coping, Indirect | 4 |
| 00339 | Template, Provisional Fixed Dental Prosthesis or Crown | 2 |
| 00341 | Porcelain Repair | 8 |
| 00343 | Reinforced Polycarbonate Fixed Dental Prosthesis | |
| 00344 | Polycarbonate Crown, Inlay, or Onlay | 6 |
| 00345 | Epoxy Die | 2 |
| | **400–499, CERAMIC AND CAD/CAM[a,b]** | |
| 00407 | Scan and Design-Core, CAD Data File Only | 4 |
| 00408 | Scan and Design-full contour, CAD Data File Only | 4 |
| 00409 | Scan, Design, and Milling- Core, CAD/CAM | 6 |
| 00410 | Scan, Design, and Milling- Full Contour, CAD/CAM | 10 |
| 00411 | Milling, Core, CAM | 4 |
| 00412 | Seating, Core/Full Contour | 2 |
| 00413 | Milling, Full Contour, CAM | 4 |
| 00414 | Ceramic Post/Core | 15 |
| 00415 | Pressable Ceramic, Layering Technique | 25 |
| 00416 | Pressable Ceramic, Staining Technique | 18 |
| 00417 | Ceramic Restoration, Refractory Technique | 25 |
| 00418 | Porcelain Application Only | 10 |
| 00419 | Staining and glazing | 3 |
| 00420 | Pre-manufactured Abutment modification | 5 |
| 00421 | Stumpf Die (Empress) | 1 |
| 00422 | Etching Porcelain | 1 |
| | **500–599, REMOVABLE DENTAL PROSTHESES** | |
| 00501 | Altered Cast Technique | 10 |
| 00507 | Occlusal Relation Stone Straps | 2 |
| 00508 | RDP Framework, Arch Bars, and Metal palates | 60 |
| 00509 | RDP Component | 8 |
| 00510 | Metal Pontic (Metal Dummy), Occlusal Onlay | 20 |
| 00511 | Wrought Wire Clasps | 2 |
| 00512 | Positioning and Indexing RAP[c] and/or Tube Tooth | 3 |
| 00513 | Labial Hinged Retained RDP | 20 |
| 00514 | Precision/Semi-Precision Attachment | 5 |
| 00515 | Record Base and Occlusion Rim, Partially Edentulous Casts | 10 |
| 00516 | Set-up, RDP-Balanced Occlusion | 13 |
| 00517 | Set-up, RDP-Non-Balanced Occlusion | 9 |

**Table C–1. Composite laboratory values and codes (continued)**

| Code | | CLV |
|---|---|---|
| 00518 | Processing Only, RDP | 20 |
| 00519 | Complete Processing of Acrylic Resin, RDP | 87 |
| 00520 | Processing, RAP and/or Tube Tooth | 4 |
| 00521 | Remount and Equilibration of Processed RDP | 7 |
| 00522 | Finish and Polish RDP | 10 |
| 00523 | Rebase RDP, Auto-polymerized or Light Cured | 17 |
| 00524 | Rebase RDP, Heat-Cured | 22 |
| 00525 | Reline RDP, Auto-polymerizing or Light-Cured Resin | 17 |
| 00526 | Reline, RDP, Heat-Cured Resin | 22 |
| 00527 | Block-Out Interim RDP | 2 |
| 00528 | Interim RDP, Auto-polymerizing or Light Cured Resin (Complex) | 25 |
| 00529 | Interim RDP, Auto-polymerizing or Light Cured Resin (Simple) | 15 |
| 00530 | Interim RDP, Heat-Cured Resin (Complex) | 50 |
| 00531 | Interim RDP, Heat-Cured Resin (Simple) | 30 |
| 00532 | Characterizing Denture Base | 30 |
| 00533 | Flexible Removable Prosthesis (Simple) | 51 |
| 00534 | Flexible Removable Prosthesis (Complex | 61 |
| 00535 | Flexible Removable Prosthesis Repair (Injection Method) | 19 |
| 00536 | Flexible Removable Prosthesis Repair (Non-Injection Method) | 5 |
| 00537 | Veneer Only, Acrylic Resin or composite Veneer | 14 |
| 00538 | Characterized Veneer or Special Staining, Glazing | 5 |
| | **600–699, MAXILLOFACIAL** | |
| 00601 | Cast, Maxillofacial, Complex or Sectional | 8 |
| 00602 | Fabrication of Stone Mold, Maxillofacial | 15 |
| 00603 | Fabrication of Metal Mold, Maxillofacial | 20 |
| 00607 | Implant Framework | 70 |
| 00608 | Precision/Semi-Precision Attachment | 5 |
| 00609 | Casting, Complex, Metal, Maxillofacial | 80 |
| 00612 | Sculpture of Prosthesis, Maxillofacial | 20 |
| 00613 | Processing Prosthesis, Extraoral | 22 |
| 00614 | Processing, Acrylic Resins Complex, Maxillofacial | 30 |
| 00615 | Radiation Carriers, Shields, and Docking Devices | 30 |
| 00616 | Custom Acoustic Earpiece | 5 |
| 00617 | Custom Ocular Prosthesis | 80 |
| 00618 | Oral Orthotic Devices | 20 |
| 00619 | Stereolithography | 1 |
| | | |

Legend:
[a] CAD – computer-aided design
[b] CAM – computer-aided manufacturing
[c] RAP – Reinforced Acrylic Resin Pontic

Note:
* Credit one CLV for each 6 minutes of actual, hands-on fabrication time. If a project takes 1 hour, take credit for 10 CLVs.

## APPENDIX D

## LAVA™ FRAMEWORK SUBMISSION STANDARDS

### D–1. Model preparation

*a*. A precise model preparation is vital for quality and fit of the restoration. All dies, the alveolar ridge, and all other segments need to be removable and need to have a defined seat in the base. Working casts (especially ones with multiple preparations) should come with dies labeled to match coordinating teeth numbers.

*b*. The scanner will then digitize the dies, alveolar ridge, bite registration, and adjacent teeth. Upon completion, they can be visualized on screen according to the individual needs (see Figure D–1.)

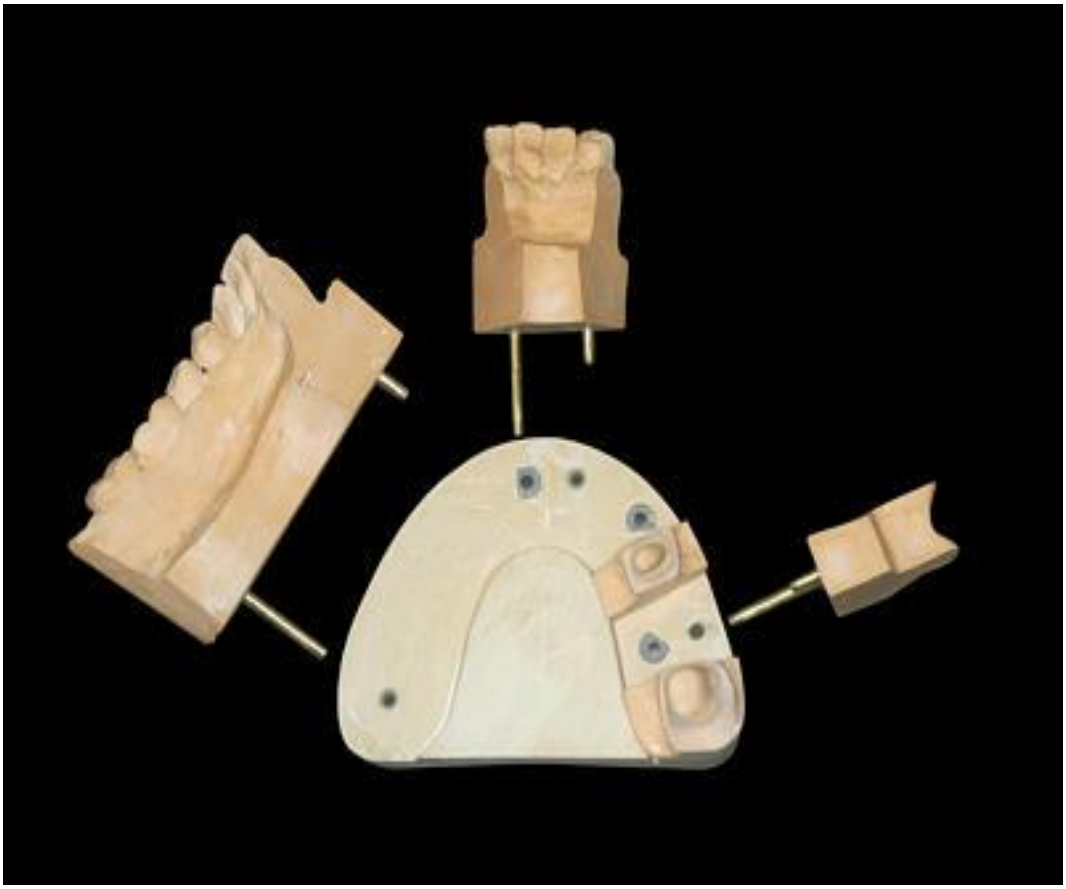

***Figure D–1. Precise model preparation***

Source: Lava™ Precision Solutions, Handling and Prep Made Easy (Model Preparation—Segmented Model figure, page 10). ©Copyrighted 3M. 2011. All Rights Reserved.

**D–2. Separation of dies from the cast**

*a*. When separating the dies from the cast, as much of the edentulous ridge as possible must be kept intact. This facilitates the proximal contouring of restorations in relation to the edentulous ridge and gingival sulcus of the abutment tooth. The maximum height of the model, measured from the bottom of the base to the top of the incisal edge, should not exceed approximately 40 mm. No die spacer is needed or desired on preparations for Lava frameworks because spacing for an opaque layer is not required.

*b*. The models and dies are lightly sprayed to enhance scan visibility. This, along with the cement gap spacing offered by the software, leaves enough room while still allowing an intimate fit (see Figure D–2).

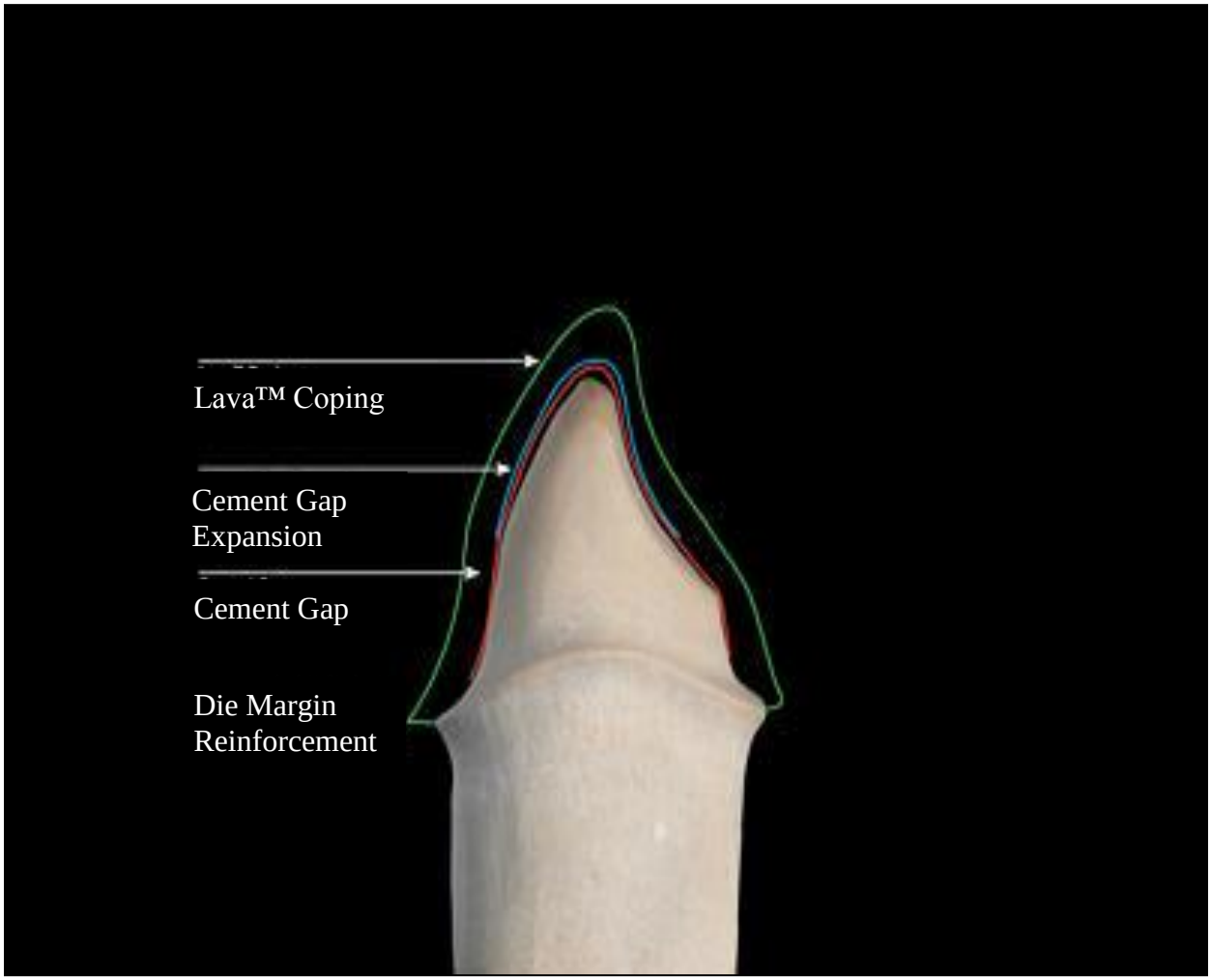


***Figure D–2. Lava coping design features***

Source: Lava™ Precision Solutions, Handling and Prep Made Easy (Cement Gap—Recommendations for Cement Gap Dimensions figure, page 12). ©Copyrighted 3M. 2011. All Rights Reserved.

## GLOSSARY

**CAD**
computer-aided design

**CAM**
computer-aided manufacturing

**CDA**
Corporate Dental Application

**CLV**
composite laboratory value

**CONUS**
contiguous United States

**CSM**
Command Sergeant Major

**DENTAC**
Dental Activity

**DD Form**
Department of Defense Form

**DOD**
Department of Defense

**FDP**
fixed dental prosthesis

**FTDR**
First-Term Dental Readiness

**mm**
millimeter

**MO**
metal occlusion

**OCONUS**
outside contiguous United States

**PFM**
porcelain-fused-to metal

**PO**
porcelain occlusion

**PVS**
poly vinylsiloxane

**RAP**
Reinforced Acrylic Resin Pontic

**RDP**
removable dental prosthesis

**SSN**
social security number

**USADL/ADL**
U.S. Army Dental Laboratory

**VIP**
Very Important Person

**WTU**
Warrior Transition Unit

By Order of the Secretary of the Army:

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