

RESTORATIVE DENTISTRY 533

Conservative Operative
Cavity Preparation and Restoration

Winter Quarter 2007

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RESTORATIVE DENTISTRY 534

Posterior Class II Direct Restorations

Spring Quarter 2007

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Course Description

Restorative Dentistry 533 and 534 are didactic and laboratory courses developed to give the student experience and knowledge of posterior and anterior direct single tooth restorations. Today's clinician must be able to use amalgam, composite and glass ionomers materials in clinical restorative dentistry. Tooth preparations designed for these materials, along with placement, carving, finishing and polishing, will be taught in the laboratory and discussed in lecture sessions. Advantages, limitations, and expected longevity of the various procedures will be the focus of the presented materials. Diagnosis, prevention and medical treatment of early caries will also be discussed.

Dent 533 and Dent 534, will comprise a two-quarter series. Each of them is a two credit hour course that consists of both a lecture and a laboratory component. The lectures will be designed to strengthen and reinforce the required reading as well as provide the most up-to-date information on the techniques and materials used which may not be found in the current text. The laboratory exercises are designed to give the student hands on experiences with the covered procedures.

The anatomic features of the posterior and anterior teeth taught in Dent 417, the waxing technique taught in Dent 433, and the nomenclature associated with internal preparations taught in Dent 430 will make many of the concepts discussed in these courses familiar.

Goals

The major goals of the course are to introduce students to principles of *conservative* tooth preparation, the characteristics of dental composite resin, glass ionomer and amalgam, the indications and contraindications for their use in the restoration of anterior and posterior teeth, and enable students to acquire skills to prepare and restore different types of cavities. These courses (533 and 534), in addition to 536, 537 and 538, taught later in the curriculum, will bring together principles learned from previous courses and will prepare you to make diagnoses and treatment plans for a variety of restorative procedures.

533 Course Objectives

Upon completion of the **Lecture** portion of this course, the students should be able to:

1. Describe tooth numbering and the nomenclature for tooth surfaces and intracoronal cavity preparations.
2. Describe G. V. Black's classification of cavities and steps of cavity preparation.
3. Describe the principles concerning adequate dentinal support and proper cavosurface angles in enamel for composite and glass ionomer cavity preparations and restorations.
4. Describe the characteristics of composite, glass ionomer as dental materials and the manipulation and placement of these materials in various tooth preparations.
5. Describe and place clinically acceptable rubber dam isolation for anterior and posterior Class V, Class III and Class IV restorations.
6. Understand the etiology and pathology of primary and secondary (or recurrent) decay.
7. Understand the concepts as well as the techniques involved in adhesive dentistry.
8. Describe the main types of composite that are used for restoring anterior and posterior teeth along with the advantages and disadvantages of each of the materials
9. Understand how various clinical parameters (dentin moisture, contamination, etching or conditioning, material layering, light curing etc.) potentially influence the final restoration

At the completion of the **Laboratory** portion of the course, the students should be able to:

1. Describe and place clinically acceptable rubber dam isolation for anterior and posterior Class V, Class III and Class IV restorations.
2. Describe, prepare, place, finish and polish restorations for:
 - a. Class V composite and glass ionomer
 - b. Class III composite
 - c. Class IV composite

534 Course Objectives

Upon completion of the **Lecture** portion of this course, the student should be able to:

- 1) Determine the factors under consideration when deciding whether to restore proximal surfaces of posterior teeth.
- 2) Determine the most appropriate restorative material to use and the ramifications of the selection in terms of cost, longevity appearance, conservation of tooth structure, limitations etc.
- 3) Understand the manipulation of amalgam and its properties.
- 4) Understand the concepts as well as the techniques involved in adhesive dentistry, particularly as they relate to posterior direct composite placement.
- 5) Describe the main types of composite that are used for restoring posterior teeth and the advantages and disadvantages of each of the materials.
- 6) Understand the appropriate application of bases and liners beneath dental restorations and the purpose of those procedures.
- 7) Understand the biomechanics of posterior tooth fracture and how this is influenced by restorative procedures.

Upon completion of the **Laboratory** portion of this course, the student should be able to:

- 1) Adequately prepare the proximal portion of a posterior tooth without damaging the adjacent tooth.
- 2) Learn to apply bases and liners under dental restoration.
- 3) Describe, prepare, place, finish and polish restorations for:
 - a) Slot-preparations
 - b) Class II composite
 - c) Class I amalgam
 - d) Class II amalgam

Texts and Schedule

Text: Sturdevant's Art and Science of Operative Dentistry, 5th edition, Roberson, T, C.V. Mosby

Lecture: Thursday 7:30 A.M. in Room 1183

The lectures will begin promptly at 7:30 a.m. Faculty and students should be seated in the room at this time to show courtesy to the lecturer and to avoid disturbing the remainder of the class. Lectures will sometimes extend beyond the one-hour time-slot to enable certain topics to be covered early in the course.

Attendance is expected for all lectures.

Laboratory: Thursday 8:30-11:00 A.M. in Room 0005 West.

Laboratory procedures for each period are printed on the laboratory schedule. Students are expected to present to the laboratory in appropriate laboratory attire (See dress code for Dent I and II students at http://www.dent.ohio-state.edu/studentaffairs/Student_Reference_Manual/at_tire.htm which shall include the student's lab coat. All laboratory procedures will be done in a clinic-like setting using gloves, masks, eye protection and a manikin with head to simulate the live patient. Chair and manikin position similar to that used clinically will be used in the laboratory. It is expected that mirror vision will be learned during this course. Care must be taken to protect the manikin "mask" from damage, especially tearing. This most frequently occurs with attempts at direct vision when pulling the cheek with excessive force. Replacement of the manikin mask will be at the student's expense. **At the end of each lab session, the laboratory should be left clean. It is primarily the responsibility of each student to clean all the paper and debris, put stools on the bench top, place the foot pedals up and turn off the bench lights.**

Attendance is mandatory for all laboratory sessions.

Grading

Final course grades for Dent 533 are only an intermediate grade of P (indicating “*in progress*”). The final course grade will be determined by grades earned in Dent 533 and in Dent 534 (Spring Quarter).

There will be one written examination (essentially a midterm) and two laboratory practical exams during each quarter. Over the two quarters, the midterms and final will be averaged (weighted) for a didactic grade. Practical examinations will also be averaged and a laboratory grade determined.

To pass each course, the student must pass both the didactic and laboratory portions. Failure of one or the other will result in a failure of the entire course. Those failing any of the courses will be scheduled for remediation over the summer quarter. The overall grading will be done based on the following criteria:

- (A) 4.0 - 3.2
- (B) <3.2 - 2.5
- (C) <2.5 – 2.2
- (E) <2.2

Clinic Experience

Assisting in the clinics is strongly encouraged for this course. The ability to assist and view procedures taught in the course is invaluable; assisting in the clinical placement of the rubber dam will provide useful experience that will increase future clinical efficiency.

Didactic Portion (35%)

A written Midterm Examination (10%) will be comprehensive for each quarter. The written examinations will consist of true/false, multiple choice or short narrative questions based on the lecture and reading materials. A Final exam from Dent 533 and Dent 534 will compose 15% of your didactic grade.

Midterm exam I = 10%

Midterm exam II = 10%

Final exam = 15%

Laboratory Portion (65%)

1. Weekly Laboratory Attendance and Laboratory Projects

The weekly laboratory portion of the course is required. All projects must be completed to a satisfactory level in order to get credit. The projects will be graded as P or F at the end of each session. Any projects not finished in class or receiving an F grade must be redone or completed outside of class before the start of the next laboratory period and shown to the course director. Failure to complete all projects by the deadline indicated in the syllabus will decrease your average in each course by 0.5 points. (For example, if the overall grade is 3.0, then it will become 2.5). No

penalty will be incurred for daily projects that receive a failing grade or are not completed if they are completed by the deadline and shown to the course director.

2. Practical Exams

The practical grade on any procedure is determined by averaging the grades given by a minimum of 6 independent instructor evaluators and the grade sheet criteria results. A deficiency in any of the categories in the evaluation form will result in a failing grade for the particular practical.

Practical exam grading scheme

a grade of 3.5 or above is considered very good.

a grade of 3.0 is considered above average.

a grade of 2.5 is considered average.

a grade of 2.0 is considered minimally acceptable.

a grade of 1.5 or below is considered not acceptable.

OVERALL LABORATORY GRADES		
Practical 1	Cl III prep	9%
	Cl III restore	6%
Practical 2	Cl III prep	9%
	Cl III restore	3%
	Cl IV restore	3%
Practical 3	Cl II prep	9%
	Cl II restore	6%
Practical 4	Cl II prep	9%
	Cl II restore	6%
Daily grades 533		2.5%
Daily grades 534		2.5%
TOTAL OF TOTAL GRADE		65%

Policies and Procedures

Attendance in both laboratory and lecture sessions is mandatory. Regarding makeups or accommodation for students with disabilities, students are asked to meet individually with the course director if they need special accommodation in order to participate and complete this course. Absences must be handled through the Dean's office.

Academic Misconduct

Compliance with which should reflect College policies. (Standard statement per Professionalism Committee 7/13/98)

Academic Misconduct
(Inclusion for Syllabus)
Approved by Professionalism Committee
July 13, 1998

Students are expected to maintain standards of professionalism in regard to their academic performance and are expected to protect the integrity of their work at all times during the course, whether in the classroom, laboratory or clinic. Students should report any alleged misconduct by another student to the Course Director and during examinations to the Course Director and/or proctor immediately.

By way of example only and not by limitation, the following would constitute academic misconduct in Dentistry (course no): Plagiarism of another classmate's work for any class assignment or examination or communicating with another student by any means during an examination. For further examples and further information students should refer to the College of Dentistry Student Reference Book, and The Ohio State University Code of Student Conduct.

The Course Director will report cases of alleged academic misconduct to the Associate Dean of Academic Affairs who may refer the matter to the College of Dentistry Professionalism Committee.

Students are encouraged to seek discussion with the Course Director if they have any doubt about approaches and procedures that might result in charges of academic misconduct against them.

CLASS V COMPOSITE PREPARATION

EXTERNAL OUTLINE FORM

Occlusogingival width

2mm wide at the center.

Gingival position

Gingival margin is 1mm from gingival.

Mesiodistal width

The prep is centered mesiodistally on the facial surface and is 4 mm wide at incisal and 3 mm wide at gingival.

Outline shape

The occlusal wall parallels the occlusal table of the tooth. The gingival wall is concave and parallels the gingival crest. The mesial and distal walls parallel the facial line angles and diverge occlusally. Corners are rounded, not sharp.

INTERNAL FORM

Occlusal, gingival walls

Parallel or slightly divergent wall. Form 90° angles with the cavosurface.

Mesial, distal walls

Slightly divergent facially. Form 90° angles with cavosurface. Both walls are visible simultaneously when viewed from the facial.

Axial walls

Vertical and convex mesiodistally to match contour of the tooth. 1.5mm deep at occlusal. 1-1.25mm deep at gingival, mesial and distal walls.

FINISH

Margins

Smooth and regular. ½ mm, 45° bevels are placed on accessible margins.

Line angles

Each line angle is parallel to its corresponding cavosurface margin.

EVALUATION CLASS V COMPOSITE PREPARATION

EXTERNAL OUTLINE FORM

	SATISFACTORY	ACCEPTABLE	SUBSTANDARD	DEFICIENCY
Occlusogingival width	2 mm measured at center	Wide Narrow	Wide Narrow	
Gingival position	Gingival margin is 1mm from gingiva	Too close to gingival Too far from gingiva	Too close to gingival Too far from gingiva	
M-D width	Centered mesiodistally 4mm wide incisal 3mm wide gingival	Too mesial/distal Wide/narrow	Too mesial/distal (3-5mm) Wide/narrow (2-4mm)	
Outline shape	Occlusal parallels O Gingival parallels G M, D diverge occlusally No sharp angles	Shape is irregular	Shape is incorrect	

INTERNAL FORM

	SATISFACTORY	ACCEPTABLE	SUBSTANDARD	DEFICIENCY
O,G walls	Parallel or slightly divergent, 90° to surface	Undercut Too divergent Not 90°	Undercut Too divergent Not 90°	
M, D walls	Diverge facially 90° to proximal	Parallel or undercut Not 90°	Undercut Too divergent Not 90°	
Axial wall	Convex mesiodistally 1.5 mm deep at occlusal 1-1.25mm deep at G, M, D walls	Flat Deep Shallow	Concave Deep (2-2.5mm) Shallow (0.5-1mm)	Grossly deep >=2.5mm

FINISH

	SATISFACTORY	ACCEPTABLE	SUBSTANDARD	DEFICIENCY
Margins	Smooth, regular 0.5 mm 45° bevels	Rough, irregular Incorrect bevels	Rough, irregular	
Line angles	Parallel to cavosurface margin	Incorrect location	Poorly defined Incorrect location	

CLASS V COMPOSITE RESTORATION

MARGINAL AND TOOTH INTEGRITY

Margins

Margins should be smooth and regular. No excess composite or deficiencies should be detectable either visually or with an explorer. No excess over margins (flash), or voids (ditching) or open margins. Composite should not extend beyond the cavosurface margin.

Tooth structure

No modification or recontouring of sound tooth structure.

SURFACE FINISH

Surface finish

Surface is uniformly smooth and free of pits and voids the restoration is polished to a shin. There is no dirt or discoloration within or on the surface of the composite.

CONTOUR

Mesiodistal contour

Smoothly convex. Continuous with tooth contour.

Occlusogingival contour

Convex, continuous with tooth contour.

EVALUATION CLASS V COMPOSITE RESTORATION

MARGINAL AND TOOTH INTEGRITY

	SATISFACTORY	ACCEPTABLE	SUBSTANDARD	DEFICIENCY
Margins	No excess or deficiency visually or with explorer Smooth and regular	Excess Deficiency Rough, irregular	Excess Deficiency Rough, irregular	Gross excess or deficiency (> 1mm) severe flash, open margin
Tooth structure	No recontouring or damage	Recontoured or damage to tooth	Recontoured or damage to tooth	Gross removal of tooth

SURFACE FINISH

	SATISFACTORY	ACCEPTABLE	SUBSTANDARD	DEFICIENCY
Surface finish	Smooth, polished, free of scratches, pits, discoloration, dirt	Rough, dull, scratched, pitted, discolored, dirty	Rough, scratched, pitted, irregularities	

CONTOUR

	SATISFACTORY	ACCEPTABLE	SUBSTANDARD	DEFICIENCY
Mesiodistal contour	Convex, continuous with tooth	Flat Too convex Discontinuous	Flat Too convex, concave Discontinuous	
Occlusogingival contour	Convex, continuous with tooth	Flat Too convex Discontinuous	Flat Too convex, too concave Discontinuous	

CLASS III COMPOSITE PREPARATION

EXTERNAL OUTLINE FORM

Occlusal outline

Entry on marginal ridge. Cavity extends gingivally from middle of proximal contact. Incisal margin maintains contact with the adjacent tooth and is in the middle of contact area. Other margins are free of contact.

Extensions

Incisogingival width is 1.75 to 2.0 mm without bevels. The gingival margin must be clean from the adjacent tooth by 0.5mm. Facial margin is slightly visible from facial. Axial wall is 1.0 to 1.25 mm deep mesiodistally without the bevel.

Outline shape

The shape is rectangular with no sharp cavosurface angles or corners.

INTERNAL FORM

Incisal and gingival walls

Parallel or slightly divergent proximally. Form 90° angles with proximal and lingual surfaces. They are not undercut.

Facial wall

Parallel to lingual surface. Not necessarily vertical. 90° to proximal.

FINISH

Margins

Smooth and regular. ½ mm, 45° bevels are placed on accessible margins, i.e., lingual and portions of incisal and gingival.

Walls/line angles

Smooth, flat, well defined. All line angles are well defined.

Adjacent tooth

The adjacent tooth should be undamaged.

EVALUATION CLASS III COMPOSITE PREPARATION

EXTERNAL OUTLINE FORM

	SATISFACTORY	ACCEPTABLE	SUBSTANDARD	DEFICIENCY
Prep Location	Correct position, incisal touches middle of contact	Incisal Gingival	Incisal Gingival	
Extensions facial, axial, gingival	Facial: slightly visible from facial Axial is 1.0 - 1.25 mm Incisogingival width is 1.75 - 2.0 mm	Facial: deep, shallow Axial: deep, shallow I-G: wide, narrow	Facial: deep, shallow Axial: deep, shallow I-G: wide, narrow	Grossly overextended >2.5mm deep
Outline shape	Rectangular No sharp angles	Round Sharp angles	Round Sharp angles	

INTERNAL FORM

	SATISFACTORY	ACCEPTABLE	SUBSTANDARD	DEFICIENCY
I,G walls	Parallel or slightly divergent, 90° to proximal and lingual	Undercut Too divergent Not 90°	Undercut Too divergent Not 90°	
Facial wall	Parallel to lingual 90° to proximal	Not parallel Not 90°	Not parallel Not 90°	
Axial wall	Parallel to proximal 90° to lingual	Not parallel Undercut Not 90°	Not parallel Undercut Not 90°	

FINISH

	SATISFACTORY	ACCEPTABLE	SUBSTANDARD	DEFICIENCY
Margins	Smooth, regular 0.5 mm 45° bevels	Rough, irregular Incorrect bevels	Rough, irregular Incorrect bevels: absent or too wide(>1mm)	
Walls/line angles	Walls: smooth, flat, well defined Line angles: well defined, parallel to cavosurface margin	Walls rough, not flat Line angles: lack definition, incorrect location	Walls rough, not flat Line angles: lack definition, incorrect location	
Adjacent tooth	Undamaged	Damaged	Damaged	Grossly damaged (requires restoration)

CLASS III COMPOSITE RESTORATION

MARGINAL INTEGRITY/SURFACE FINISH

Margins

Margins should be smooth and regular. No excess composite or deficiencies should be detectable either visually or with an explorer. No flash, or voids or open margins. Composite should not extend beyond the cavosurface margin.

Surface finish

Surface is uniformly smooth and free of pits and voids the restoration is polished to a shin. There is no dirt or discoloration within or on the surface of the composite.

Tooth structure

No modification or recontouring of sound tooth structure.

CONTACT AND PROXIMAL CONTOUR

Contact

Incisally located at height of contour of adjacent tooth and 1-2 mm wide incisogingivally. Visual contact with adjacent tooth. Definite but not excessive resistance to passage of dental floss.

Embrasures

Four embrasures (incisal, gingival, facial, and lingual) are reproduced, consistent with normal contours.

Proximal contour

Normal contours of the tooth are reproduced. The proximal is convex incisogingivally and faciolingually and is continuous with tooth contours.

LINGUAL CONTOUR

Contour

Lingual contour reproduces normal tooth anatomy and is continuous with remaining marginal ridge.

EVALUATION CLASS III COMPOSITE RESTORATION

MARGINAL INTEGRITY/SURFACE FINISH

	SATISFACTORY	ACCEPTABLE	SUBSTANDARD	DEFICIENCY
Margins	No excess or deficiency visually or with explorer Smooth and regular	Slight excess Deficiency Rough, irregular	Moderate excess (>0.5mm) Deficiency (>0.5mm) Rough, irregular	Gross excess or deficiency, (>1mm) severe overhang, open margin
Surface finish	Smooth, polished, free of scratches, pits, discoloration, dirt	Slight rough, dull, scratched, pitted, discolored, dirty	Moderate rough, dull, scratched, pitted, discolored, dirty	
Tooth structure	No recontouring or damage	Slight recontoured or damage to tooth	Moderate recontoured or damage to tooth	Gross removal of tooth (exposure of dentin)

CONTACT AND PROXIMAL CONTOUR

	SATISFACTORY	ACCEPTABLE	SUBSTANDARD	DEFICIENCY
Contact	Visual contact Correct width, position	Wide, narrow Incorrect position	Wide, narrow Incorrect position	Visually open contact. No floss passes through.
Embrasures	The 4 embrasures have normal contour	Closed Too open	Closed Too open	
Proximal contour	Convex Continuous with tooth contour	Slight flat Not continuous with tooth contour	Moderate flat, concave Not continuous with tooth contour	

LINGUAL CONTOUR

	SATISFACTORY	ACCEPTABLE	SUBSTANDARD	DEFICIENCY
Contour	Contour of tooth is restored	Over contour Under contour	Over contour Under contour	

CLASS IV COMPOSITE RESTORATION

MARGINAL INTEGRITY/SURFACE FINISH

Margins

Should be smooth and regular. No excess composite or deficiencies should be detectable visually or with an explorer. No flash, voids or open margins. Composite should not extend beyond the cavosurface margin.

Surface finish

Surface is uniformly smooth and free of pits and voids. The restoration is polished to a shine. There is no dirt or discoloration within or on the surface of the composite

Tooth structure

No modification or recontouring of sound structure.

CONTACT AND PROXIMAL CONTOUR

Contact

Incisally located at height of contour of adjacent tooth and 1-2 mm wide incisogingivally. Visual contact with adjacent tooth. Definite but not excessive resistance to passage of dental floss.

Embrasures

Four embrasures (incisal, gingival, facial, and lingual) are reproduced, consistent with normal contours and symmetrical with contralateral tooth.

Proximal contour

Normal contours of the tooth are reproduced. The proximal is convex incisogingivally and faciolingually and is continuous with tooth contours.

FACIAL/LINGUAL CONTOURS

Facial contour

Facial contour reproduces normal tooth anatomy and is continuous with remaining facial structure. The mesiofacial line angle is smoothly convex and matches contralateral tooth.

Lingual contour

Lingual contour reproduces normal tooth anatomy and is continuous with remaining lingual structure. The mesiolingual marginal ridge is the same height and contour of contralateral tooth.

Incisal edge/point angle

The height, angle, thickness and contour of the incisal edge and point angle are consistent with remaining tooth structure and match contralateral tooth.

EVALUATION CLASS IV COMPOSITE RESTORATION

MARGINAL INTEGRITY/SURFACE FINISH

	SATISFACTORY	ACCEPTABLE	SUBSTANDARD	DEFICIENCY
Margins	No excess or deficiency visually or with explorer Smooth and regular	Slight excess Deficiency Rough, irregular	Moderate excess (>0.5mm) Deficiency (>0.5mm) Rough, irregular	Gross excess or deficiency (>1mm). Severe flash or open margins
Surface finish	Smooth, polished, free of scratches, pits, irregularities, discoloration, dirt	Slight rough, dull, scratched, pitted, discolored, dirty	Moderate rough, dull, scratched, pitted, discolored, dirty	
Tooth structure	No recontouring or damage	Recontoured or damage to tooth	Recontoured or damage to tooth	Gross removal of tooth (exposure of dentin)

CONTACT AND PROXIMAL CONTOUR

	SATISFACTORY	ACCEPTABLE	SUBSTANDARD	DEFICIENCY
Contact	Visual contact 1-2 mm wide Correct position	Wide Narrow Incorrect position	Wide Narrow Incorrect position	Visually open contact. No floss passes through.
Embrasures	The 4 embrasures have normal contour	Closed Too open	Closed Too open	
Proximal contour	Convex Continuous with tooth contour	Slight flat Not continuous with tooth contour	Moderate flat Not continuous with tooth contour	

FACIAL/LINGUAL/INCISAL CONTOUR

	SATISFACTORY	ACCEPTABLE	SUBSTANDARD	DEFICIENCY
Facial contour	Continuous with tooth Line angle correct, matches contralateral tooth	Over contour Under contour Line angle incorrect	Over contour Under contour Line angle incorrect	Gross over or under contour
Lingual contour	Continuous with tooth Marginal ridge matches contralateral tooth	Over contour Under contour Marginal ridge incorrect	Over contour Under contour Marginal ridge incorrect	Gross over or under contour
Incisal edge/point angle	Height, angle, thickness, contour match contralateral tooth	High, low Thick, thin Sharp, round	High, low Thick, thin Sharp, round	Gross over or under contour

CLASS I AMALGAM PREPARATION

EXTERNAL OUTLINE FORM

Occlusal outline

Includes mesial central and distal pits. Centered on central groove. Includes buccal and lingual grooves, ½ way to cusp ridges. Mesial and distal marginal ridges are 1.5 – 2.00 mm wide. Smoothly flowing with no sharp angles.

Isthmus width

1 to 1.25 mm wide buccolingually where the triangular ridges meet.

INTERNAL FORM

Buccal, lingual walls

Parallel to long axis of tooth. Parallel or slightly convergent occlusally.

Mesial, distal walls

Slightly divergent occlusally.

Pulpal depth

Minimum depth is 1.5 mm in central pit. Maximum depth is 2 mm at triangular ridges. Greater than 3 mm is a pulp exposure. Pulpal floor is horizontal.

FINISH

Margins

Smooth and regular. No chips or bevels.

Walls/line angles

Smooth and well defined. Vertical walls are flat occlusogingivally. The pulpal and gingival floors are flat in both dimensions. All line angles are well-defined.

EVALUATION CLASS I AMALGAM PREPARATION

EXTERNAL OUTLINE FORM

	SATISFACTORY	ACCEPTABLE	SUBSTANDARD	DEFICIENCY
Occlusal extensions	Pits and grooves included, centered	Over extended Under extended	Over extended Under extended	Grossly over or under extended
Isthmus width	1.0 to 1.25 mm wide	Wide Narrow	Wide Narrow	≥ 3.0 mm wide
Occlusal outline	Smooth curve	Sharp	Sharp	

INTERNAL FORM

	SATISFACTORY	ACCEPTABLE	SUBSTANDARD	DEFICIENCY
B, L walls	Parallel or slightly convergent occlusally	Divergent Undercut	Divergent Undercut	Gross divergence, total lack of resistance and retention
M, D walls	Slightly divergent or vertical	Vertical Undercut Too divergent	Undercut Too divergent	
Pulpal depth	1.5-2 mm deep	Shallow Deep	Shallow Deep	>3 mm deep in pit
Pulpal floor	Horizontal	Angle	Angle	

FINISH

	SATISFACTORY	ACCEPTABLE	SUBSTANDARD	DEFICIENCY
Margins	Smooth, regular	Rough, irregular	Rough, irregular	
Walls	Smooth and flat	Rough Curved	Rough Curved	
Line angles	Well defined	Lack definition	Poorly defined	

CLASS I AMALGAM RESTORATION

MARGINAL INTEGRITY/SURFACE FINISH

Margins

Margins should be smooth and regular. No excess amalgam or deficiencies should be detectable either visually or with an explorer. No flash, or gingival overhang. No evidence of voids, open or ditched margins.

Surface finish

Amalgam surface should be uniformly smooth and free of scratches, pits, voids, and irregularities. Handpiece and burs should **NOT** be used for contouring, finishing, or polishing.

Tooth structure

No modification or recontouring of sound tooth structure.

OCCLUSAL ANATOMY

Grooves

Closely reproduce the normal anatomy of the tooth. The central, buccal, and lingual grooves are centered within the tooth. Well defined.

Fossae

The central, mesial, and distal pits should have the original depth and location.

Cuspal planes

The buccal and lingual slopes should reproduce those of the tooth. The cuspal planes should not be concave (under contoured).

OCCLUSION

Restoration

New restoration is in proper centric occlusion. Any centric marks (articulating paper) on the restoration are no heavier than other marks on the tooth and adjacent teeth.

EVALUATION CLASS I AMALGAM RESTORATION

MARGINAL INTEGRITY/SURFACE FINISH

	SATISFACTORY	ACCEPTABLE	SUBSTANDARD	DEFICIENCY
Margins	No excess or deficiency visually or with explorer Smooth and regular	Excess Deficiency Rough, irregular	Excess Deficiency Rough, irregular	≥.5mm excess or deficiency, severe flash, open margins
Surface finish	Smooth, free of scratches, irregularities	Rough, scratched, irregularities	Rough, scratched, irregularities	
Tooth structure	No recontouring or damage	Recontoured or damaged tooth	Recontoured or damaged tooth	Gross removal of tooth structure

OCCLUSAL ANATOMY

	SATISFACTORY	ACCEPTABLE	SUBSTANDARD	DEFICIENCY
Grooves	Proper location, depth and width, well defined	Misplaced Shallow, deep, wide Lack definition	Misplaced Shallow, deep, wide Poorly defined	
Fossae	Proper location, Depth and width	Misplaced Shallow, deep, wide	Misplaced Shallow, deep, wide	
Cuspal planes	Reproduce remaining cuspal inclines	Under contour Over contour	Under contour Over contour	

OCCLUSION

	SATISFACTORY	ACCEPTABLE	SUBSTANDARD	DEFICIENCY
Restoration	Correct occlusion	Slightly high or on incline	High occlusion or on incline	Grossly high or incorrect occlusion

CLASS II AMALGAM PREPARATION

EXTERNAL OUTLINE FORM

Occlusal outline

Includes mesial central pits and does not cross oblique ridge. Centered on central groove. Extends into buccal groove, ½ way to cusp ridge. Outline is smooth, rounded and flowing. No sharp angles.

Isthmus width

1 to 1.25 mm wide buccolingually where the triangular ridges meet.

Proximal extensions

Contact is visibly open on buccal, lingual, and gingival walls. Clearance is at least 0.25mm (explorer tip) and less than 0.5mm.

INTERNAL FORM

Buccal, lingual walls

Parallel or slightly convergent to occlusal. Form 90° angles with the proximal surface. Reverse curve usually needed on buccal.

“Dovetail” wall

Vertical or slightly divergent toward marginal ridge.

Pulpal floor

Minimum depth is 1.5 mm in central pit. Maximum depth is 2 mm at triangular ridges. Horizontal.

Axial wall

Parallels proximal surface, convex buccolingually. Vertical. 1 to 1.25 mm deep measured mesiodistally at the gingival floor.

Gingival floor

Flat, smooth and perpendicular to the long axis of the tooth. No gingival bevel.

Retention

Buccal and lingual grooves in dentin at axial line angles. From gingival to pulpoaxial line angle. Placed with 169L or ¼ round bur. Depth is ½ head of bur (0.25mm). Not placed in axial or gingival walls

FINISH

Margins

Smooth and regular. No chips or bevels.

Walls/line angles

Smooth and well defined. Vertical walls are flat occlusogingivally. The pulpal and gingival floors are flat in both dimensions. All line angles are well defined. The pulpal-axial line angle is rounded.

Adjacent tooth

The adjacent tooth should be undamaged. It may be smoothed with a finishing strip if the polishing does not adversely alter the shape of the contour and/or contact.

EVALUATION CLASS II AMALGAM PREPARATION

EXTERNAL OUTLINE FORM

	SATISFACTORY	ACCEPTABLE	SUBSTANDARD	DEFICIENCY
Occlusal outline	Correct position, incisal touches middle of contact	Incisal Gingival	Incisal Gingival	
Isthmus width	1.0 to 1.25 mm wide	Wide Narrow	Wide Narrow	≥ 3.0 mm wide
Proximal extensions	Visually free of contact	Over extended Under extended	Over extended Under extended	≥ 2mm beyond contact

INTERNAL FORM

	SATISFACTORY	ACCEPTABLE	SUBSTANDARD	DEFICIENCY
B, L walls	Parallel or slightly convergent occlusally 90° to proximal	Divergent Undercut Not 90°	Divergent Undercut Not 90°	Gross divergence, total lack of resistance and retention
“Dovetail” wall	Slightly divergent or vertical	Undercut Too divergent	Undercut Too divergent	
Pulpal floor	1.5-2 mm deep, horizontal	Shallow Deep Angled	Shallow Deep Angled	>3 mm deep in pit
Axial Wall	Parallel to proximal Vertical, Convex 1 to 1.25mm deep	Not parallel Undercut, flat Shallow Deep	Not parallel Undercut,concave Shallow Deep	≥ 2.5mm deep
Gingival floor	Flat, no bevel	Angled	Angled, bevel	
Retention	In dentin, 0.25mm deep	Deep, wide	Deep, wide, misplaced	

FINISH

	SATISFACTORY	ACCEPTABLE	SUBSTANDARD	DEFICIENCY
Margins	Smooth, regular	Rough, irregular	Rough, irregular	
Walls/line angles	Walls: smooth, flat, well defined Line angles: well defined, pulpal-axial is rounded	Walls rough, curved Line angles: incorrect, pulpal-axial is sharp	Walls rough, curved Line angles: poorly defined	
Adjacent tooth	Undamaged	Damaged	Damaged	Grossly damaged

CLASS II AMALGAM RESTORATION

MARGINAL INTEGRITY/SURFACE FINISH

Margins

Margins should be smooth and regular. No excess amalgam or deficiencies should be detectable either visually or with an explorer. No flash, or gingival overhang. No evidence of voids, open or ditched margins.

Surface finish

Amalgam surface should be uniformly smooth and free of scratches, pits, voids, and irregularities. Handpiece and burs should **NOT** be used for contouring, finishing, or polishing.

Tooth structure

No modification or recontouring of sound tooth structure.

CONTACT/PROXIMAL CONTOUR

Contact

There is visual contact with adjacent tooth. Contact gives definite but not excessive resistance to passage of dental floss. Correct position is at height of contour of adjacent tooth. Width is 1-1.5 mm.

Embrasures

Four embrasures (occlusal, gingival, facial, and lingual) are reproduced, consistent with normal contours.

Proximal contour

Normal contours of the tooth are reproduced. The proximal is convex and continuous with tooth surfaces. Neither flat nor concave.

ANATOMY/OCCLUSION

Marginal ridge

Reproduces the missing contour of the tooth. Normally, concave bucco-lingually and convex mesio-distally and the same height as the adjacent tooth's marginal ridge.

Grooves

Closely reproduce the normal anatomy of the tooth. The central, buccal, and lingual grooves are centered within the amalgam. Well defined.

Fossae

The central, mesial, and distal pits should have the original depth and location.

Cuspal planes

The buccal and lingual slopes should reproduce those of the tooth. The cuspal planes should not be concave (under contoured).

Restoration

New restoration is in proper centric occlusion. Any centric marks (articulating paper) on the restoration are no heavier than other marks on the tooth and adjacent teeth.

EVALUATION CLASS II AMALGAM RESTORATION

MARGINAL INTEGRITY/SURFACE FINISH

	SATISFACTORY	ACCEPTABLE	SUBSTANDARD	DEFICIENCY
Margins	No excess or deficiency visually or with explorer Smooth and regular	Excess Deficiency Rough, irregular	Excess Deficiency Rough, irregular	≥.5mm excess or deficiency, severe overhang, open margin
Surface finish	Smooth, free of scratches, pits, voids, irregularities	Rough, dull, scratched, pitted, discolored, dirty	Rough, dull, scratched, pitted, discolored, dirty	Voids
Tooth structure	No recontouring or damage	Recontoured or damage to tooth	Recontoured or damage to tooth	Gross removal of tooth

CONTACT/PROXIMAL CONTOUR

	SATISFACTORY	ACCEPTABLE	SUBSTANDARD	DEFICIENCY
Contact	Visual contact Correct width, position	Wide, narrow Incorrect position	Wide, narrow Incorrect position	Visually open contact, cannot pass floss
Embrasures	The 4 embrasures have normal contour	Closed Too open	Closed Too open	
Proximal contour	Convex Continuous with tooth contour	Flat Not continuous with tooth contour	Flat, concave Not continuous with tooth contour	

ANATOMY/ OCCLUSION

	SATISFACTORY	ACCEPTABLE	SUBSTANDARD	DEFICIENCY
Marginal ridge Cuspal planes	Proper height, width, contour	High, low/Wide, narrow Under, over contoured	High, low/wide, narrow Under, over contoured	
Grooves/ fossae	Proper location Depth, width Well defined	Incorrect location Depth, width Not defined	Incorrect location Depth, width Not defined	
Restoration	Correct occlusion	Slightly high or on incline	High occlusion or on incline	Grossly high or incorrect occlusion