



THE INNOVATION OF LAMINATE VENEERS

—Two Decades of Clinical and Research Excellence—

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Table of Contents

Opening Graph (Case Presentation)

013 Clinical Application of the Plane System

Chapter 1 Prologue: Stability and Its Biomimetic Principle of Conventional Laminated Veneers With Adhesion+ MI

040 ❖ **1. Introduction: New Vision by Combination of “Adhesion + MI”**

040 1) MI Is a Concept That Freely Transcends the Boundary Between Restorative and Prosthetic Dentistry

042 ❖ **2. Is it Integrity of Restoration or Integrity of Tooth Substance That We Seek?**

042 1) Choices to Avoid Falling Into the “Circle of Death”

046 ❖ **3. All The Groundwork Is in Place to Put MI and Biomimetics Into Practice**

046 1) Adhesive Restorative Treatment Is Now Undergoing a Period of Dramatic Change

048 ❖ **Summary of This Section**

Chapter 2 Conventional Laminate Veneer Restorations:
Medium to Long Term Follow-Up Cases

052 ❖ **1. Introduction**

052 1) Laminated Veneers, Which Have Been on the Market for Approximately 40 Years

052 ❖ **2. The History of Laminate Veneer Restoration**

052 1) The First Laminate Veneers Were Developed for Hollywood Actors

054 2) Application of Ceramic Materials and Advances in Adhesive Technology

055 3) Emergence of the MI Concept

056 4) The Biomimetic Approach Mimicking the Structure of Living Organisms

060 5) From BPRs to BCRs: The Evolution of Materials



061	❖ 3. Case Presentations
062	1) Case 1: A Case of Extensive Crown Fracture of the Central Incisor
064	2) Case 2: A Case of Restoring Anterior Interproximal Spaces With Porcelain Laminate Veneers
068	3) Case 3: Extensive Anterior Teeth Crown Fracture Case I
071	4) Case 4: Extensive Anterior Teeth Crown Fracture Case II
082	5) Case 5: Management of Tetracycline-Stained Teeth
088	6) Case 6: Full-Mouth Reconstruction and Laminate Veneer Restoration for a Patient With Severe Periodontal Disease and Occlusal Collapse
098	7) Case 7: Treatment of a Gummy Smile Using Orthodontic Treatment and Additive Veneers
113	8) Case 8: Fractured Teeth Restored With a Sandwich Veneer Technique
123	9) Case 9: Full-mouth Reconstruction Using Molar Non-Prep Laminate Veneers and Anterior Palatal Veneers in a TMD Patient with Adjusted Jaw Position
133	10) Case 10: Root Coverage Microsurgery Combined With Laminate Veneers for a Patient With Significant Disharmony of the Gingival Margin Caused by Gingival Recession
138	11) Case 11: Aesthetic Improvement With Laminate Veneers in a Patient Requesting Mock-Ups (Bleach-Shade Case)
152	❖ Summary of This Section

Chapter 3 Case Presentation: A Masterpiece of Conventional Laminate Veneers
A Minimally Invasive Full-Mouth Adhesive Rehabilitation Case for Moderate Dental Erosion

156	❖ 1. Introduction
156	1) Current Status of Dental Erosion in Japan and Its Management
157	❖ 2. The Effects of Dental Erosion and Attrition
157	1) Functional, Aesthetic, and Biological Issues Caused by Dental Erosion
157	❖ 3. Classification and Treatment of Dental Erosion in the Maxillary Anterior Region: ACE Classification
157	1) ACE Classification Based on Five Parameters
158	❖ 4. Objectives and Planning of Restorative Treatment
158	1) Objectives of Restorative Treatment for Dental Erosion
159	2) VDO Setting Method
161	❖ 5. Minimally Invasive Full-Mouth Adhesive Rehabilitation
162	1) Restoration Methods for Anterior Teeth and Material Selection
164	2) Restoration Methods and Material Selection for Molars



165	❖ 6. Overview of the Case Presented in This Section and the Treatment Process
165	1) Initial Visit
165	2) VDO Determination
165	3) Treatment Plan and Actual Implementation for the Anterior Region
189	4) Treatment Plan and Actual Procedure for the Molar Region
189	5) Completion of the Restorations (Maxillary Anterior Palatal Veneers and Molar Occlusal Veneers)
190	6) Final Abutment Preparation in the Anterior Region
190	7) Delivery of Final Restorations (Maxillary Anterior Lip-Side Laminate Veneers)
190	❖ Summary of This Section

Chapter 4 Laminate Veneers: The Movement to Digitalization

194	❖ 1. Introduction
194	1) Digital Application Is Essential for Laminate Veneers From Now on
195	❖ 2. Materials in Digital Ceramic Restorations
195	1) Prognosis for CAD/CAM Laminate Veneers Is Now Accumulating
196	2) Types of Materials Currently Available
207	❖ 3. The Accuracy of Digital Equipment (Laminate Veneer Treatment Protocols and Skills in the New Digital Era)
207	1) Intraoral Scanners Offer Clinical Accuracy Comparable to Silicone Impressions
209	2) What Is "Edge Loss," the Structural Problem in Optical Impression Taking?
210	3) Clinical Solutions to Edge Loss and Abutment Preparation Methods in the Digital Era to Improve Internal Fit
225	4) Influence of Interproximal Space on Intraoral Scanner Scan Results
240	5) Effect of Various Material Types and Thicknesses on Milling Results
253	❖ Summary of This Section

Chapter 5 The Classifications of Anterior Laminate Veneer Tooth Preparation and Clinical Cases of Digitalized Veneers

257	❖ 1. Introduction: Basics for Classifying Anterior Laminate Veneer Preparation Designs
257	1) Seven Types of Preparation Designs and Their Indications
262	2) Various Finish Line Forms and Trends in the Literature
266	3) Required Ceramic Thickness of the Restorations in the Literature Review
269	4) The Effect of the Preparation Design on Tooth Flexure Control



273	❖ 2. Feather-Edge Preparation (Vertical Preparation) and Digital Technology Compatibility
273	1) "BOPT" by Loi and Di Felice
275	2) "Controlled Sulcular Dis-epithelization" by Scutellà et al.
284	❖ 3. Development of Bar Kits for Laminate Veneer Abutment Preparation (Feather-Edge/Vertical Preparation) and Diamond Electroplated Tips for Air Scalers
284	1) Bar Kits for Abutment Preparation Developed by the Author
288	2) Diamond Electroplated Tips for Air Scalers
289	❖ 4. Classification of Anterior Laminate Veneer Preparation and Digital Laminate Veneer Case Presentation
289	1) Class I: "Non-Prep" Additive Design Laminate Veneer
305	2) Class II: Short Wrap Design Laminate Veneer
313	3) Class III: "180°" Medium Wrap Design Laminate Veneer
313	4) Class IV: "270°" Long Wrap Design Laminate Veneer
345	5) Class V: "360°" Full Wrap Design Laminate Veneer
362	6) Class VI: Palatal Laminate Veneer
362	7) Class VII: Sandwich Design Laminate Veneer
387	❖ Summary of This Section

Chapter 6 The Classifications of Posterior Laminate Veneer Tooth Preparation

393	❖ 1. Introduction: Fundamentals for Classifying Molar Occlusal Veneer Preparations
393	1) A Molar Laminate Veneer Classification Emphasizing Enamel Preservation
395	2) The Biomimetic Approach, Bio-Mechanics, and Tooth Flexure Control
399	3) Considerations on the Recommended Preparation Design for Molar Laminate Veneers
414	❖ 2. Classification of Molar Occlusal Veneer Preparation
415	1) Class I: "Non-Prep" Additional Veneer
417	2) Class II: Occlusal Veneer (Division I and II)
417	3) Class III: Palatal Veneer
418	4) Class IV: Veneer-Lay
418	5) Class V: Inter-proximal Included Veneer
418	6) Class VI: Endo-Crown
418	❖ Summary of This Section

426	❖ 1. Introduction
426	1) Prologue to the Final Chapter
427	❖ 2. Outline of This Chapter
427	1) In the Paradigm Shift to Digital Dentistry
427	❖ 3. Clinical Achievements in Indirect MI Restorative Treatment
427	1) From a Case of Pre-digital Laminate Veneers
429	❖ 4. Clinical Discussion on Future Treatment Protocols for Minimally Invasive Full-Mouth Rehabilitation
429	1) Three Clinical Discussion Points
429	❖ 5. Restorative Treatment for Dental Erosion
429	1) Dental Erosion Demands Early Intervention and Conservative Treatment With Adhesives
430	❖ 6. Case Presentation
430	1) Chief Complaint
431	2) Basic Data Collection
433	3) Purpose of Restorative Treatment and Treatment Planning
435	4) The Treatment Flow of Minimally Invasive Full-Mouth Rehabilitation
437	5) STEP 1 (Digital Approach)
437	6) STEP 2 (Microscope Approach)
444	7) STEP 3 (Digital Approach)
444	8) STEP 4 (Microscope Approach)
444	9) STEP 5 (Digital and Conventional Approaches)
456	❖ 7. Conclusion
458	❖ Summary of This Section
460	Index

Opening Graph (Case Presentation)



Clinical Application of the Plane System

Clinical Case

The term “Facially Generated Treatment Planning” (treatment planning based on facial aesthetics) has long been established in dentistry. For treatment planning involving restorative and prosthetic procedures, particularly those involving the anterior teeth, aesthetic guidelines have been established. It is essential to perform an aesthetic analysis of the facial features and the lip-tooth relationship prior to the examination of the teeth and dentition¹. Furthermore, with the advent of the digital era, the fabrication of prostheses using CAD/CAM has become the norm. Digital dentistry is now evolving into a tool to assist in examination and diagnosis and to determine treatment strategies. In this context, many software programs for aesthetic analysis have emerged². However, two-dimensional analysis is inadequate for extension to functional

analysis, particularly those involving sagittal plane elements. Consequently, the development of a 3D facial scanner in combination with a digital facebow and digital articulator has been eagerly awaited³.

The Plane System (Zirkonzahn, Toshin Dental Supply) is a comprehensive term that refers to facebow transfer in the natural head position (NHP) using the Plane Finder in an upright position, the PS1 full-scale virtual articulator system, and 3D facial scanning via the Face Hunter. This is a groundbreaking system⁴ that enables functional and aesthetic analysis, diagnosis, design of restorative and prosthetic devices, and subsequent CAD/CAM fabrication. The author will now present a clinical case in which this system was utilized.



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Fig. 34 State of fit after placement of the final restoration. The fit is excellent.



a



b



c

Figs. 35a to c Harmony with the lips after placement of the final restorations.

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Figs. 115a and b Occlusal views after laminate veneer placement.

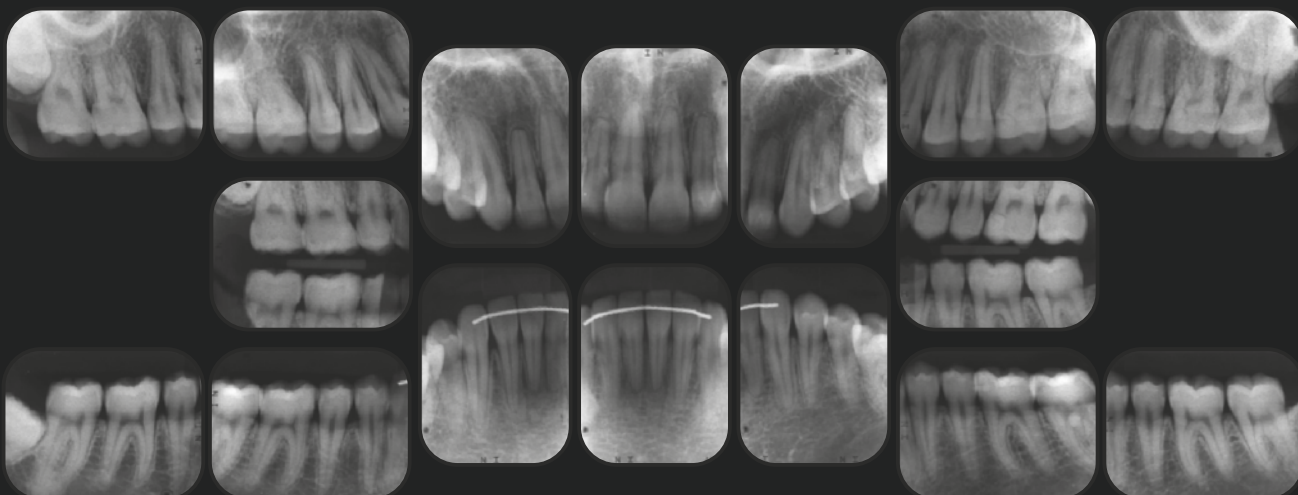


Fig. 116 Sixteen-film periapical radiographs after laminate veneer placement.



Fig. 117 Four years after laminate veneer placement.

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Figs. 181a to d After laminate veneer placement (dental technician: Shigeo Kataoka [Osaka Ceramic Training Center]).

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Fig. 204 Post placement of maxillary anterior laminate veneers.



Figs. 205a and b Mandibular anterior laminate veneers in place.

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A Case of Minimally Invasive Full-Mouth Adhesive Rehabilitation for Moderate Dental Erosion (Continued)



Figs. 49a to e VDO elevation and occlusal plane optimization, and mutually protected occlusion were established.



Figs. 50a to e Occlusal views. Even with the sandwich approach, the natural appearance of the anterior teeth is exceptionally high. Additionally, in the posterior region, maximum function and form were achieved using a press technique that does not require complex laboratory procedures.



Figs. 51a and b #18 implant was restored with a zirconia custom abutment, and the superstructure was a monolithic crown fabricated from lithium disilicate.

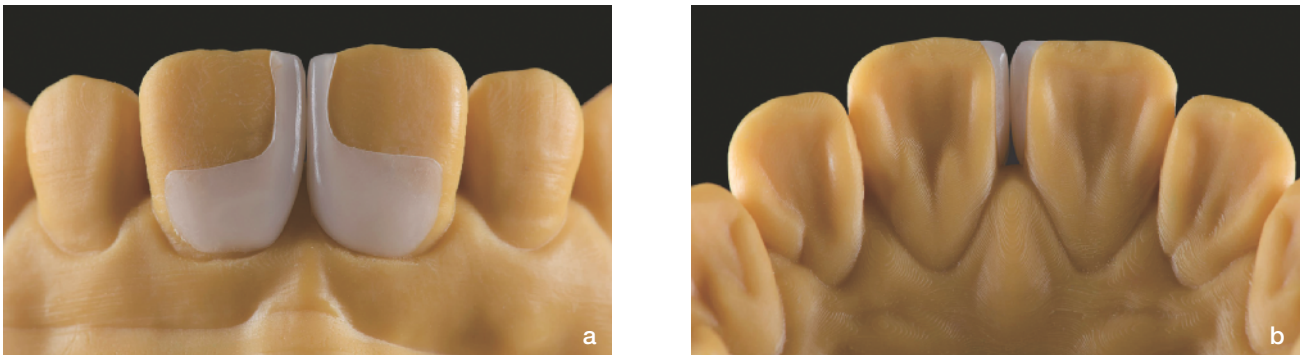
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“Non-Prep” Additive Design Laminate Veneer: Final Laminate Veneer Design



Figs. 83a and b The final laminate veneer design was completed.

“Non-Prep” Additive Design Laminate Veneer: Fabrication of Provisional Restorations

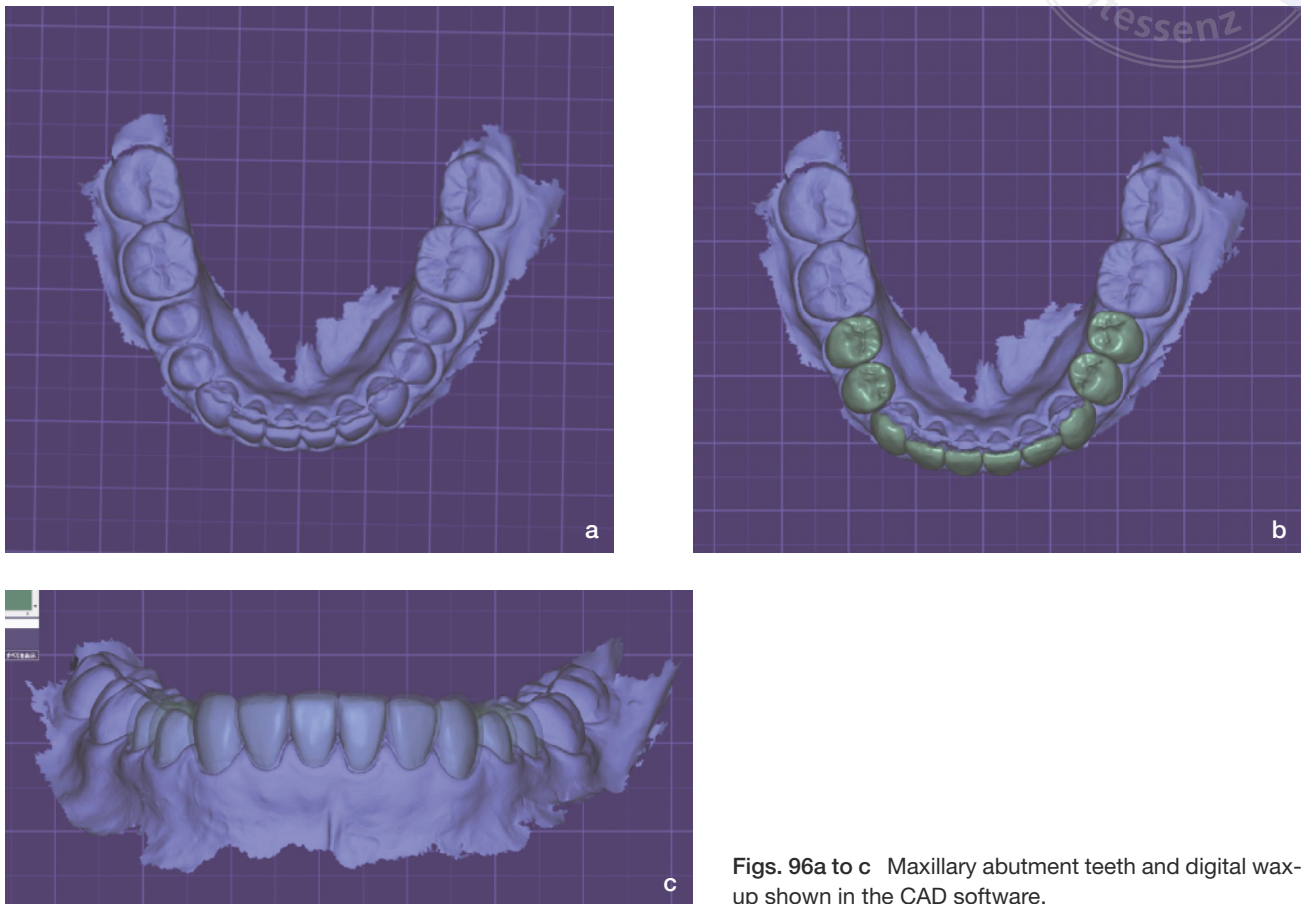


Figs. 84a and b Provisional restorations fabricated using Shofu Block HC.

c) Fabrication and Placement of the Provisional Restoration

The provisional restoration was fabricated using the previously described polymer block, Shofu Block HC (Fig. 84). The intraoral placement of the provisional restoration is shown in Fig. 85. The key evaluation parameters here were: (1) Verification of the processing limitations, (2) Verification of the final morphological modification, and (3) color and shade verification (determination of the color of the final material). As shown in the experiments

Short Wrap Design Laminate Veneer: Digital Wax-Up of the Mandible

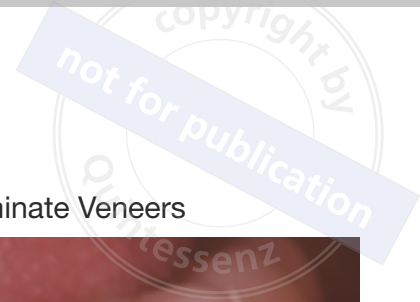


Figs. 96a to c Maxillary abutment teeth and digital wax-up shown in the CAD software.

(non-shoulder preparation) for the short wrap design (Figs. 93 and 94). It can be seen that no definitive edge is visible on either the cervical or interproximal surfaces (Figs. 95 and 96). In mandibular anterior abutment preparation, it is often thought that securing a greater reduction can enhance the strength of the laminate veneer, but this is erroneous; bonding to the enamel should be emphasized. Furthermore, for the incisal edge, complex reproduction of mamelons, such as in the maxillary anterior region, is not required, making it desirable to perform a more conservative preparation, particularly given the thin enamel of Japanese patients. **Figure 96a** shows the data of this case after abutment preparation, and it can be seen that only a slight abutment preparation was performed to remove the undercut for the path of insertion. The impression data was then confirmed on CAD, and a digital wax-up was performed. The mandible was restored with six laminate veneers from canine to canine and veneer-lays on the mandibular bilateral first and second premolars (Figs. 96b and c).

b) Fabrication and Placement of the Definitive Restorations

Figures 97 and 98 show the mandibular laminate veneers at the time of placement. The patient's chief complaint was to make her teeth as white as possible. Normally, porcelain or



Short Wrap Design Laminate Veneer: Cementation of Mandibular Laminate Veneers



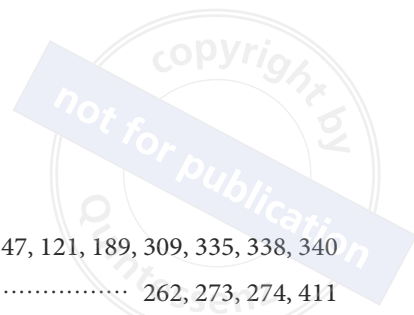
Fig. 97 Mandibular laminate veneers cemented in place.



Fig. 98 The treatment was able to proceed without removing the bonded wire, even during the bonding procedure of the final restorative device, a zirconia laminate veneer.

glass-ceramic is the first choice for laminate veneer restorations, but in this case, a so-called multi-layer zirconia, which is not highly translucent, was deliberately selected. Nowadays, many patients request bleach shades. The author, who has traditionally pursued harmony with natural teeth using glass-ceramic, has increasingly chosen zirconia in some cases, as it can produce a brighter shade with minimal tooth reduction. For those patients who request very white teeth, the moderate opacity and gradation of the multi-layer zirconia disc, which is currently gaining popularity, are highly convenient.

In the anterior maxillary region, the author used aligners to achieve a certain degree of alignment and adjustment of the cervical level; however, orthodontic intrusive movement alone was insufficient for the maxillary left lateral incisor and canine. Therefore, surgical crown lengthening was performed using a surgical guide fabricated with a 3D printer, to the extent that the gingival finish line could be set within the enamel (Fig. 99). Figure 100 shows the condition of the abutment preparation after complete gingival healing. The maxillary central incisors were crown-retreated, and short wrap preparations (laminate



Index

123

- “180°” medium wrap design laminate veneer 258, 313
- “270°” long wrap design laminate veneer 259, 313
- “360°” full wrap design laminate veneer 259, 345

A

- Abutment tooth preparation 24, 25, 26, 45, 47, 65, 66, 72, 73, 74, 75, 76, 83, 84, 92, 93, 94, 95, 104, 105, 115, 117, 118, 121, 133, 135, 142, 145, 146, 147, 148, 161, 164, 172, 174, 175, 176, 180, 181, 189, 190, 206, 207, 210, 211, 213, 215, 216, 217, 225, 228, 256, 257, 258, 260, 262, 268, 271, 273, 274, 276, 279, 280, 284, 287, 288, 289, 299, 300, 307, 308, 309, 310, 312, 322, 323, 324, 348, 349, 350, 351, 352, 353, 354, 363, 364, 365, 367, 368, 369, 373, 374, 379, 387, 398, 416, 417, 420, 421, 422, 428, 436, 437, 441, 443, 444, 447, 448, 451, 456, 457, 458
- ACE Classification 157, 158, 165, 173, 437
- Adjustment of the direction of the insertion axis 218
- AISCM 194, 221, 222
- Analog Inner Surface Correction Method 194, 221, 222
- APC concept 201
- Aprismatic Enamel 257, 300, 323, 415
- Attrition 46, 99, 126, 157, 161, 162, 165, 166, 167, 168, 189, 345, 347, 363, 429, 430, 431, 432, 433, 437, 442, 443
- Average enamel thickness of Japanese human first molar 419

B

- BCRs 59, 60
- Bio-mechanics 395
- Biomimetic approach 56, 68, 223, 224, 395
- Biomimetic technology 55, 56, 396
- Bleach shades 138, 143, 309, 345
- Bonding See Bonding procedure

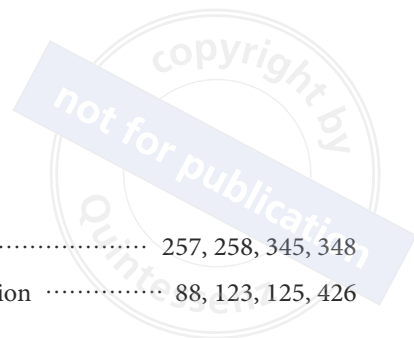
- Bonding procedure 47, 121, 189, 309, 335, 338, 340
- BOPT 262, 273, 274, 411
- BPRs 59, 60
- Bruxism 82, 125, 141, 156, 157, 164, 190, 206, 345, 359, 429, 432, 437, 442

C

- Chipping 43, 44, 107, 210, 244, 248, 251, 252, 269, 327, 329, 417, 427, 431
- Circle of death 42
- Classification of dental glass-ceramics 197
- Comparison of conventional, semi-digital, and full digital processes 328
- Comparison of translucency between highly translucent zirconia and lithium disilicate 203
- Composite resin 14, 20, 23, 43, 47, 53, 54, 57, 58, 64, 65, 73, 75, 104, 112, 113, 114, 115, 117, 142, 143, 156, 163, 164, 166, 173, 269, 272, 293, 320, 321, 326, 371, 393, 394, 401, 402, 406, 432, 437, 439, 440, 441, 442, 446, 457
- Controlled sulcular dis-epithelization 275
- Crossover 125, 167

D

- Dental erosion 46, 47, 156, 157, 158, 161, 162, 163, 165, 166, 190, 363, 371, 393, 426, 427, 429, 430, 432, 433, 434, 437, 457
- Dentinoenamel junction 47, 49, 56, 58
- Depth cut 286
- Depth cut, occlusal 288
- Differences in shear bond strength of various adhesive resin cements depending on the adherend material 200
- Direct mock-up 142, 143, 144, 145, 297, 298, 320, 321, 322, 440
- Dr. Okawa laminate veneer basic kit 284, 285
- Dr. Okawa laminate veneer full kit 285, 286



E

- Edge Extension Method 208, 209
- Edge loss 208, 209, 210, 211, 214, 215, 273, 280, 303, 348, 350, 387
- Edgeless preparation 262, 271, 273, 280, 285, 348, 349, 350
- Effect of the amount of space between proximal surfaces on intraoral scan 224
- Effect of various material types and thicknesses on milling results 240
- Embrasure 23, 102
- Enamel thickness of Japanese central incisor 268
- End-to-End wear 123, 125, 126, 141, 142, 167, 347
- Endo-crown 288, 415, 418
- Etching 54, 76, 84, 142, 324, 337, 339, 340, 342, 356, 357, 401, 419

F

- Facial scanner 13, 311, 312, 366
- Facially generated treatment planning 13
- Factors affecting abutment preparation of occlusal veneers 398
- Factors affecting the predictability of occlusal veneers 399
- Feldspar 43, 47, 52, 57, 58, 60, 74, 75, 107, 173, 182, 189, 190, 198, 201, 206, 214, 215, 243, 244, 248, 269, 302, 303, 326, 327, 338
- Feldspathic See Feldspar
- Finish line 24, 65, 66, 68, 74, 75, 76, 83, 85, 92, 93, 94, 104, 105, 106, 141, 176, 189, 208, 209, 211, 212, 213, 214, 217, 218, 219, 262, 263, 264, 266, 271, 273, 274, 277, 282, 288, 309, 323, 327, 341, 348, 349, 350, 356, 408, 409, 410, 411, 412, 413, 429, 441, 444, 447, 458
- Finish line, chamfer 175, 262, 271, 272, 285, 286, 408, 410, 411
- Finish line, feather-edge 262, 264, 265, 271, 273, 275, 276, 277, 411, 412, 413, 421
- Flexural strength of various ceramic materials 203

- Full wrap 257, 258, 345, 348
- Full-mouth reconstruction 88, 123, 125, 426

G

- Geneva Erosion Study 162
- gingivittage 274, 275
- Glass-ceramic 75, 76, 164, 196, 197, 201, 204, 206, 248, 309, 337, 371, 419, 437, 456
- Guide groove 24, 180, 181, 289
- Gummy smile 98, 99, 100

H

- Hydrofluoric acid 338, 339, 340

I

- Impression See Impression taking
- Impression taking 90, 92, 142, 143, 152, 172, 207, 208, 214, 225, 227, 228, 238, 239, 277, 285, 290, 291, 298, 320, 324, 350, 445
- Indications, materials, and fabrication methods for various types of laminate veneers 260
- Interdental papilla 64, 66, 140
- Internal compensation 333
- Inter-proximal included veneer 289, 415, 418
- Interproximal space 64, 65, 66, 226
- IOS 207, 208, 209, 213, 214, 225, 323, 324, 372, 394

K

- Key points for producing CAD data 333
- Knife-edge 263, 264, 271, 272, 273, 410, 411

L

- Labial corridor 138, 140, 142
- Large chamfer 263, 264, 410, 411
- Leucite 198, 244
- Light chamfer 411, 420



Lithium disilicate 41, 52, 59, 60, 74, 75, 77, 83, 116, 119, 121, 125, 128, 152, 164, 179, 185, 189, 198, 199, 202, 203, 204, 205, 206, 209, 241, 242, 244, 248, 263, 264, 265, 266, 267, 268, 271, 345, 394, 400, 404, 405, 408, 410, 411, 419, 437, 443, 457
Lithium metasilicate 198, 199, 241, 242, 244, 248
Long contact 66
long wrap 257, 258, 285

M

Mandibular movement 123, 125, 157, 167, 431, 435
Material selection 24, 74, 76, 161, 162, 164, 174, 189, 345, 398
Medium wrap 257, 258, 273, 313
MI 40, 41, 42, 44, 46, 54, 55, 56, 82, 156, 157, 189, 194, 206, 270, 280, 284, 286, 292, 297, 299, 300, 393, 422, 426, 427
Microdont tooth See Microdontia
Microdontia 90, 98, 102, 290
Microdontic See Microdontia
Microscope 24, 26, 69, 71, 73, 80, 81, 83, 84, 85, 104, 105, 112, 114, 119, 134, 152, 174, 175, 176, 189, 194, 217, 288, 303, 330, 342, 355, 380, 387, 427, 428, 436, 437, 441, 444, 447, 455, 456
Midline diastema 95, 289, 290, 292, 293, 345, 363
Mini wing 95
Mock-up 20, 21, 22, 23, 24, 138, 141, 142, 143, 144, 145, 180, 181, 190, 279, 297, 298, 299, 319, 320, 321, 322, 439, 440, 441

N

NHP 14, 16, 17, 18, 19, 37
Night guard 128, 132, 141
Non-prep laminate veneer 123, 125, 129, 269
“Non-prep” additive design Laminate veneer
..... 257, 258, 289
“Non-Prep” additional veneer 414, 415, 417
Non-vital See Non-vital tooth

Non-vital tooth 14, 70, 73, 82, 135, 418

O

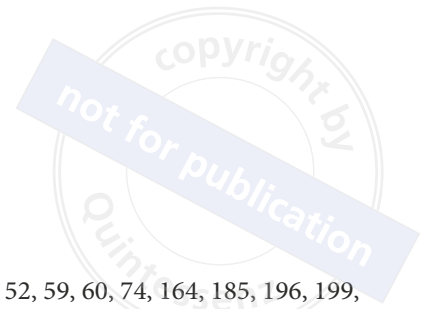
Occlusal veneer 41, 125, 126, 127, 128, 289, 392, 393, 394, 395, 398, 399, 400, 403, 406, 408, 411, 412, 414, 417, 418, 421, 422
Occlusal veneer (Division I and II) 414, 417
Open bite 363
Orthodontic treatment 62, 63, 64, 71, 75, 88, 90, 92, 98, 99, 102, 104, 116, 138, 141, 158, 195, 306, 307, 310, 312, 313, 315, 316, 317, 318, 319, 342, 348, 354, 357, 363, 368, 434
Orthodontics See Orthodontic treatment

P

Palatal laminate veneer 125, 189, 257, 258, 348, 363, 394, 421, 422
Palatal veneer 259, 362
Pathway wear 123, 125, 167
PICN 404, 405, 419
Polygon 208, 209, 238, 290, 291
Preparation See Abutment tooth preparation
Preparation design and amount of abutment reduction for occlusal veneers 420
Preparation guide 104, 117
Pressed ceramic 91, 125, 128, 152, 189, 205, 206, 286, 415
Principle of laminate veneer abutment preparation
..... 210
Provisional restoration 24, 27, 84, 141, 143, 147, 159, 161, 165, 171, 172, 174, 281, 301, 302, 312, 324, 325, 326, 330, 352, 357, 429, 437, 438, 439, 440, 441, 442, 443, 444, 456, 457, 458

R

Risk factors in esthetic rehabilitation 263
Root coverage 133, 134



ROOTY Diamond Electroplated Tip 24, 287,
288, 349, 350
Rubber dam 129, 182, 189, 340, 356, 446, 457

S

Sandwich veneer 24, 25, 27, 113, 116, 257, 348, 363,
371, 381, 382, 383, 384, 385, 386, 437, 438, 439, 440,
441, 444, 447, 450, 451, 452
Sandwich design laminate veneer 259, 362
Selective etching 401, 419
Self-etching 402, 419
Short wrap 213, 214, 256, 257, 258, 307, 309,
323, 354, 355, 363, 367, 369, 382, 383, 384, 385, 386
Short wrap design laminate veneer 258, 305
Silane coupling 338, 342
Spacer technique 220, 221
STL data 208, 210, 240, 256, 290, 291, 392

T

Tetracycline-stained tooth 82
Tooth flexure control 194, 262, 269, 271, 276,
350, 387, 395, 398, 412, 437, 447
Try-in paste 85, 340, 355

V

Various finish line forms of laminate veneers 263
VDO 156, 159, 161, 164, 165, 171, 172, 173,
174, 184, 190, 434, 435, 436
Veneer-lay 307, 308, 310, 318, 353, 354, 415, 418
Vertical preparation 262, 271, 273, 275, 276,
278, 284, 288, 411

W

Walking bleach 69, 114, 133, 135
Wear 44, 102, 123, 164, 457
Winging 138, 141, 142

Z

Zirconia 42, 52, 59, 60, 74, 164, 185, 196, 199,
200, 201, 202, 203, 204, 205, 206, 209, 241, 242, 243,
252, 261, 267, 268, 307, 309, 337, 345, 348, 350, 352,
353, 354, 355, 357, 359, 404, 419
Zirconia-reinforced lithium silicate 199