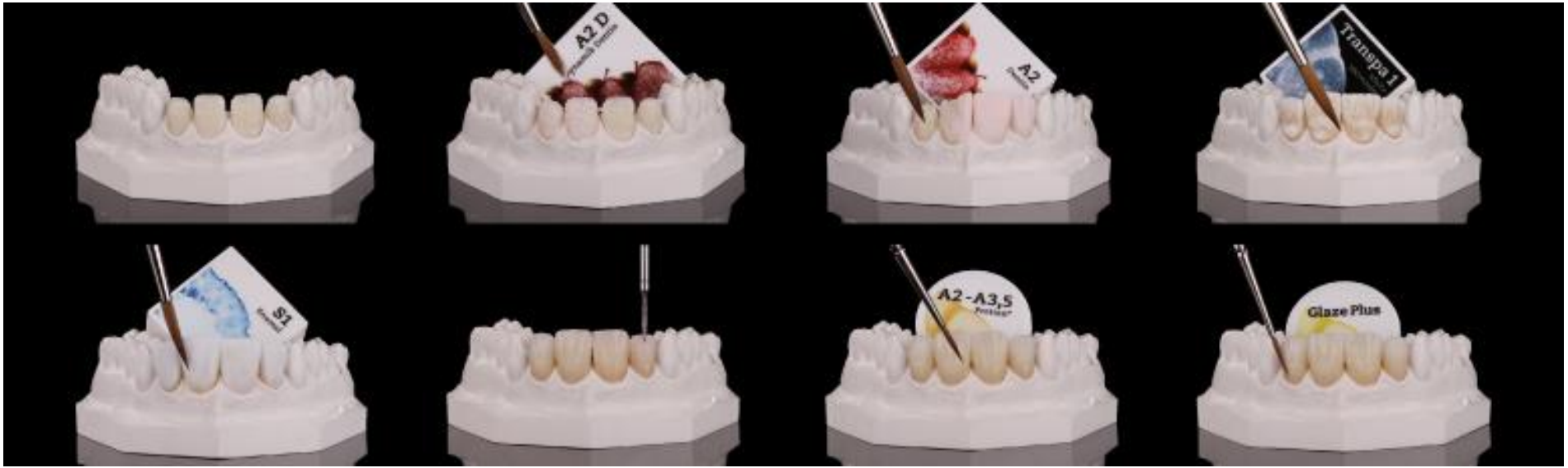
All Ceramic Materials – The complete overview



Tom Behaeghel – 14/02/2019

Claude Sieber © 2013

VITA All Ceramic Materials – The complete overview

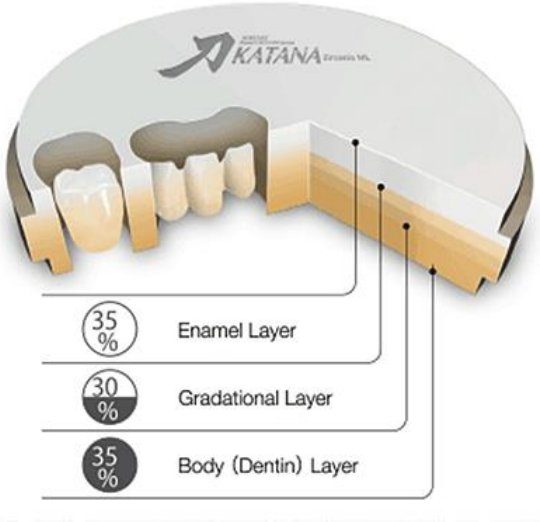


VITA All Ceramic Materials – The complete overview



VITA All Ceramic Materials – The complete overview





Specialized for FCZ (Full Contour Zirconia)

All Ceramic Materials – The complete overview

Different types of indirect restorative materials

- Aluminium Oxide
- Zirconium Dioxide
- Feldspar Ceramics
- Resin Nano Ceramics
- Glass Ceramics
- Hybrid Ceramics



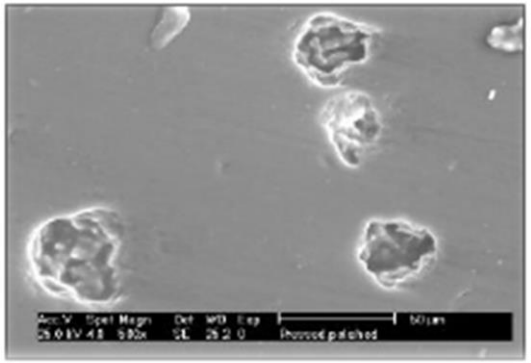
All Ceramic Materials – Feldspar Ceramics

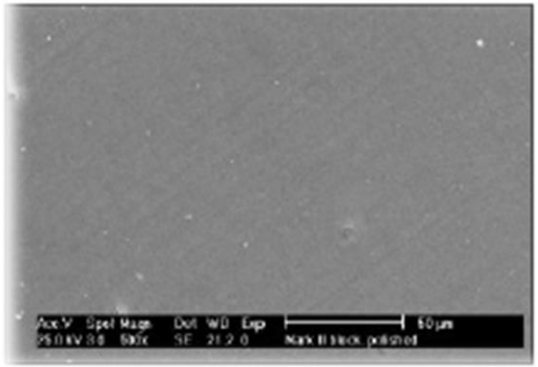


All Ceramic Materials – Feldspar Ceramics

Fine Structured feldspat ceramic







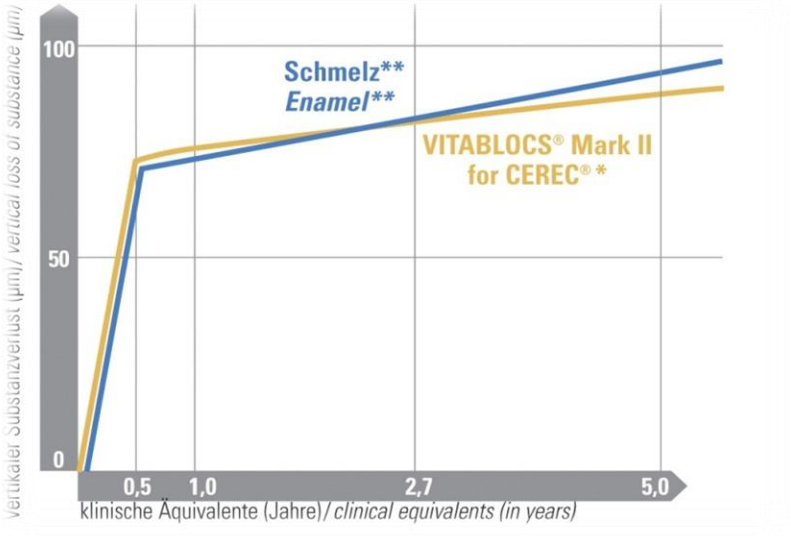


Traditionel Ceramic – Sem x500

Fine Structured feldspat Ceramic – Sem x500

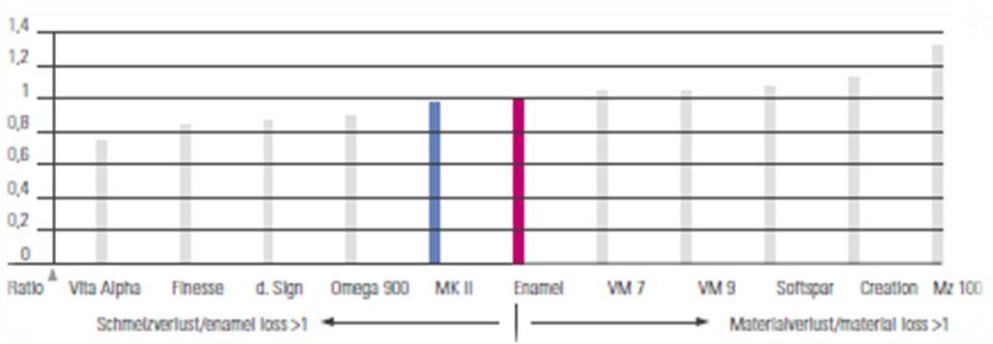
Internal Studie, Vita R&D

All Ceramic Materials – Feldspar Ceramics



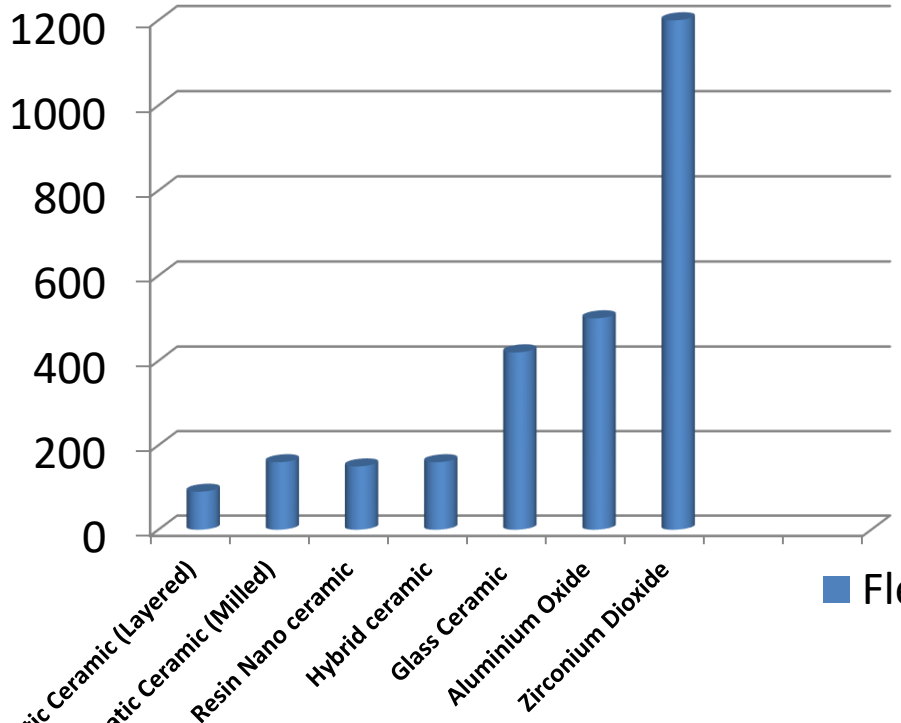
*Nach Krejci, I et al

Material & Antagonist Wear

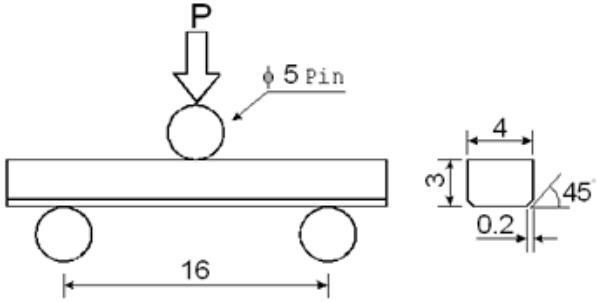


*Internal Studie, Vita R&D

All Ceramic Materials – Feldspar Ceramics







All Ceramic Materials – Feldspar Ceramics

Full-adhesive resin cement

- Adiva F – Vita Zahnfabrik
- Panavia V5 – Kuraray
- Panavia F2.0 – Kuraray
- Relyx Ultimate – 3M Espe
- G.Sem Linkforce – GC
- Variolink Esthetic – Ivoclar
- Multilink Automix – Ivoclar
- Nexus 3 (3th Gen.) – Kerr



Self-adhesive resin cement

- Adiva S – Vita Zahnfabrik
- Panavia SA Cement Plus – Kuraray
- Relyx Unicem 2 – 3M Espe
- G.Sem Linkace – GC
- Speedcem Plus – Ivoclar
- Maxcem Elite – Kerr
- Bifix SE – Voco
- Solocem – Coltene



Resin-modified glass ionomer cement

- Not Allowed



All Ceramic Materials – Feldspar Ceramics

Crown, Inlay, Onlay & Veneer (Full-Adhesive)

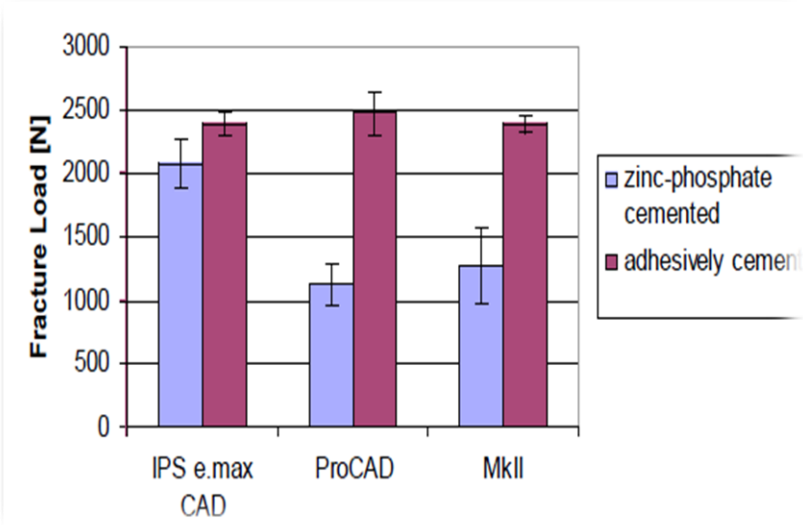
- The restoration is pretreated
  - Etched with hydrofluoric acid (5%) for 60 Sec
  - Conditioned (60sec) with a ceramic-primer
- The preparation is isolated and cleaned
  - Polishing brush and cleaning paste free of oil and fluoride
- Apply phosphoric acid gel onto the enamel (for 15 -30sec)
- Rinse with water min. 5sec and dry with compressed air
  - Enamel surfaces appear chalky white
- Apply Self-etching adhesive the tooth surface, wait for 15 sec
- Disperse the adhesive with oil- and moisture-free compressed air
  - a glossy, immobile film layer results
- (Option) Light-cure the adhesive for 10sec (Min. 500 mW/cm^2)
- Fill the restoration with adhesive composite cement
  - Light-cure 2sec / quarter with max. distance of 10mm
- Remove excess luting material and cover the margins with glycerine gel
  - Light-cure 20sec/quarter (Min. 1100 mW/cm^2)
- Wait for 5min. biting on a cotton roll.





All Ceramic Materials – Feldspar Ceramics

The Influence of Cementation





Internal Studie, Vita R&D, Bad Säckingen , Germany

All Ceramic Materials – Feldspar Ceramics

The Influence of Cementation



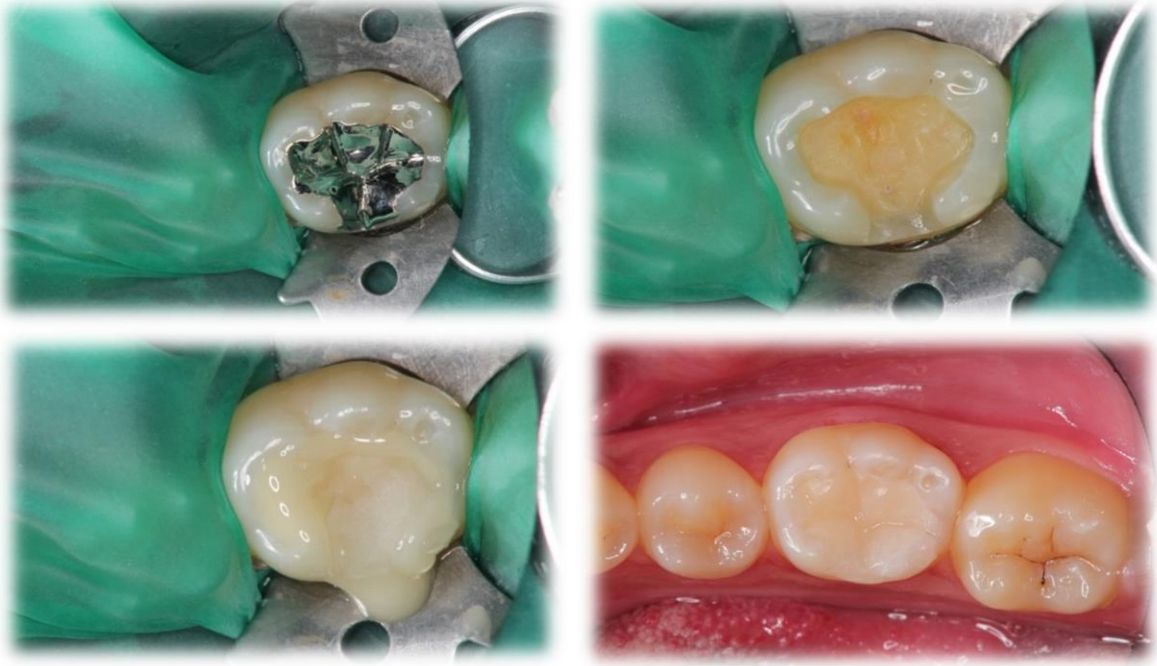


[Dr. B. Reiss: Clinical results for Cerec Inlays, over 18 Years , International Journal of Computerized Dentistry 2006; 9:11-22]

All Ceramic Materials – Feldspar Ceramics



Dr. Gunpei Koike, Tokio, Japan



All Ceramic Materials – Feldspar Ceramics







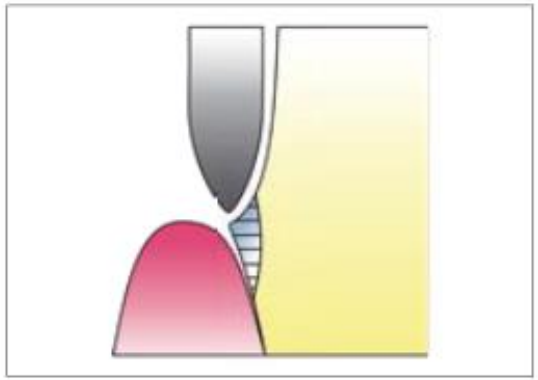


Dr. Alessandro Devigus, Bühlach (CH)

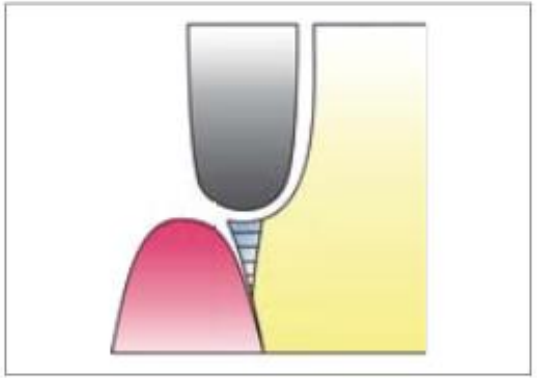


All Ceramic Materials – Feldspar Ceramics

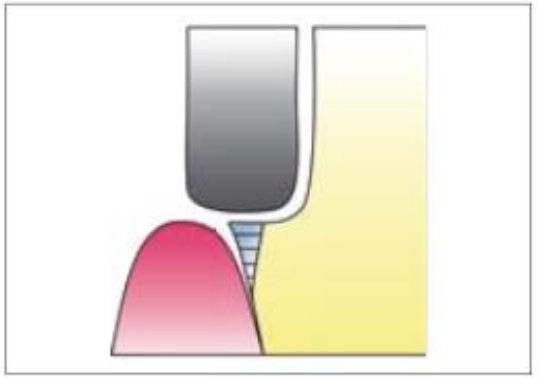
Preparation and ceramic layer thickness



Chamfer Preparation



Accentuated Chamfer Preparation

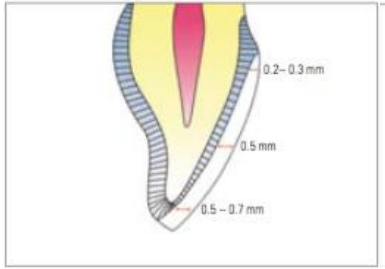


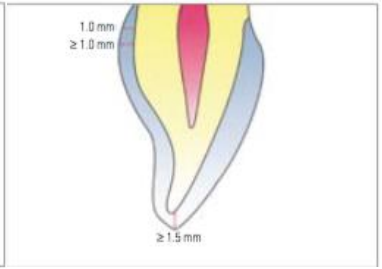
Shoulder Preparation

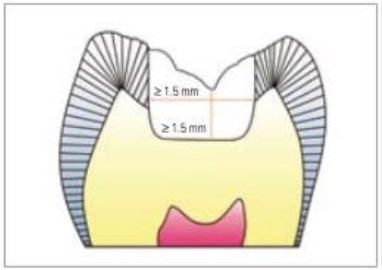
VITA Zahnfabrik, VITABLOCS® for CEREC®/inLab® Working Instructions, Issue 03.2014

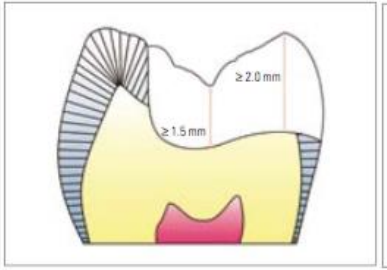
All Ceramic Materials – Feldspar Ceramics

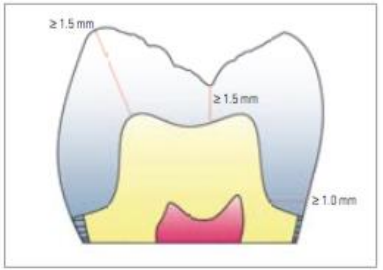
Preparation and ceramic layer thickness











VITA Zahnfabrik, VITABLOCS® for CEREC®/inLab® Working Instructions, Issue 03.2014

All Ceramic Materials – Feldspar Ceramics

Indication

- Veneers
- Inlays
- Onlays
- Anteriour Crowns



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All Ceramic Materials – Feldspar Ceramics













Dr. A. Devigus, Bülach, Schweiz

Dr. A. Devigus, Bülach, Schweiz

PD Dr. A. Bindl, Zürich, Schweiz / ZT G. Lombardi, Schweiz

All Ceramic Materials – Feldspar Ceramics

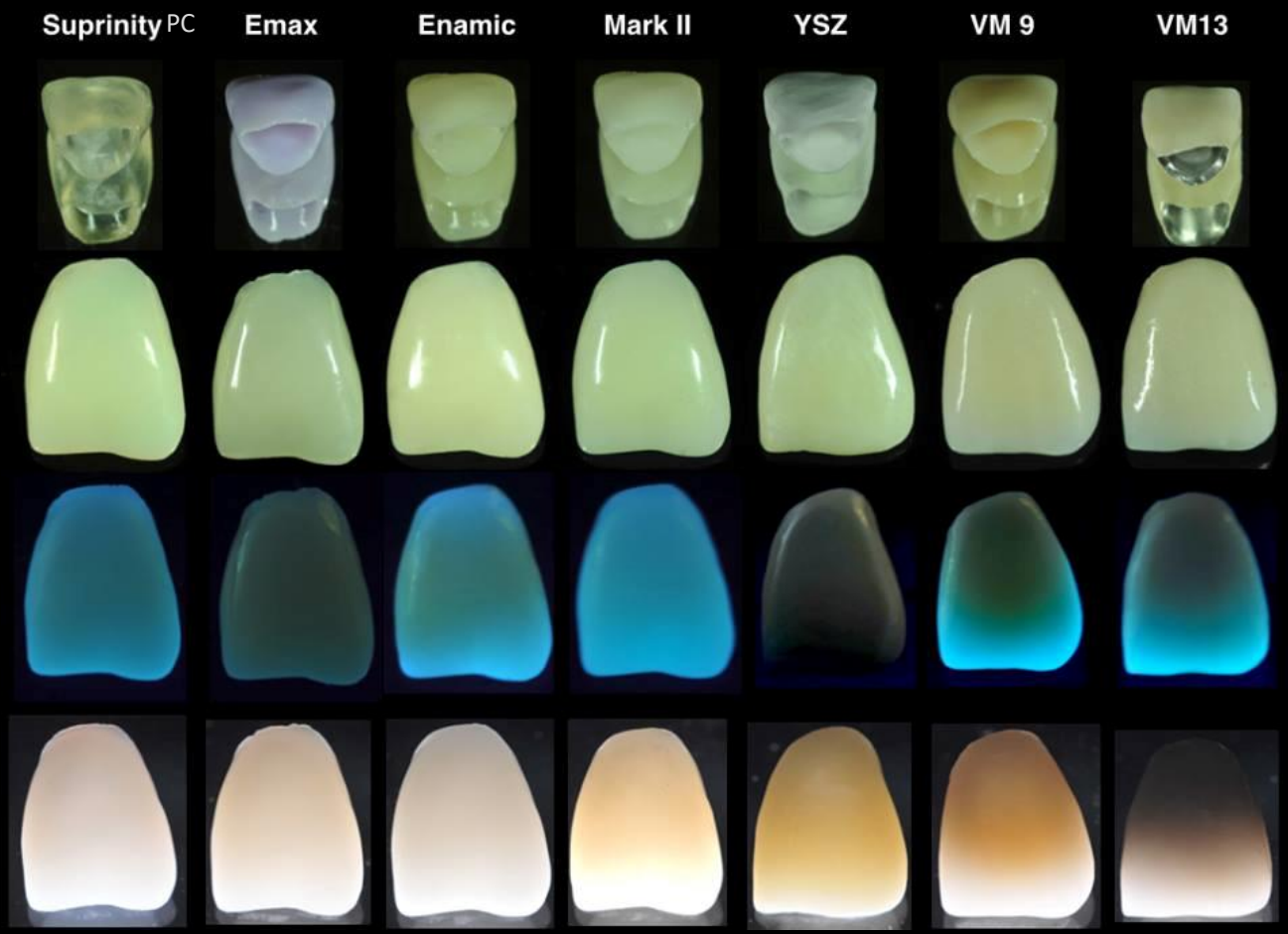






Dr. A. Kurbad, Viersen, Deutschland

VITA



ZTM Vanik Kaufmann-Jinoian, Switserland

All Ceramic Materials – Feldspar Ceramics

Advantages

- High Aesthetics
- Natural Abrasion
- Antagonist friendly
- Multiple Indication
- Perfect Bonding
- >25 years experience

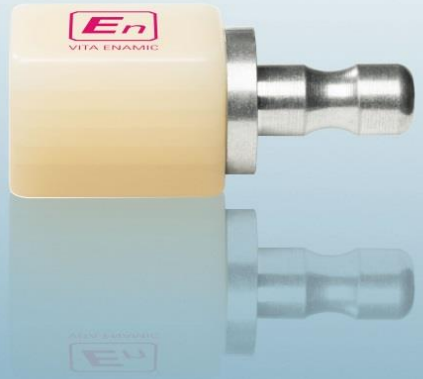
Disadvantages

- Brittle Ceramic, Chipping
- Difficult to repair
- No conventionel bonding
- Shoulder / Chamfer Preparation
- Minimal Ceramic Thickness



Recommondation: **Ideal for partiel / Aesthetic restorations – Inlays, Onlays ,veneers & anterior crowns**

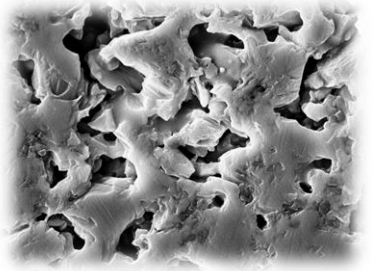
All Ceramic Materials – Hybrid Ceramics



All Ceramic Materials – Hybrid Ceramics

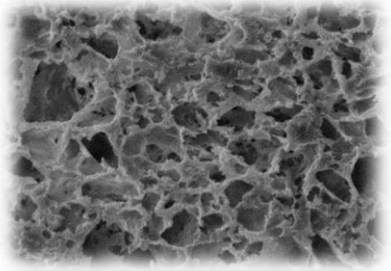


Ceramic network



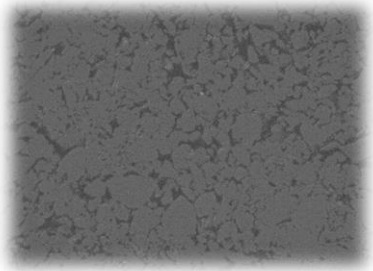


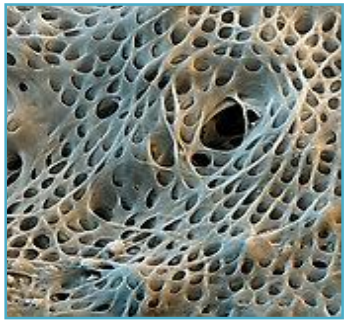
Polymer network





Hybrid ceramic





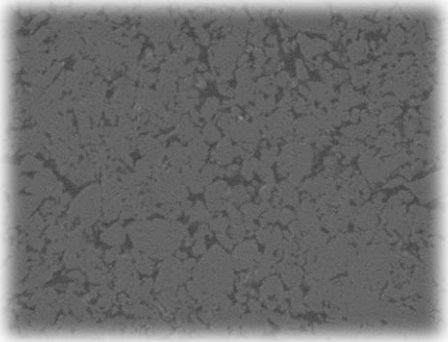


All Ceramic Materials – Hybrid Ceramics

Hybrid ceramic with
"dual network structure"

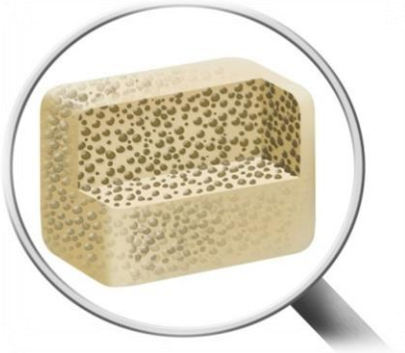


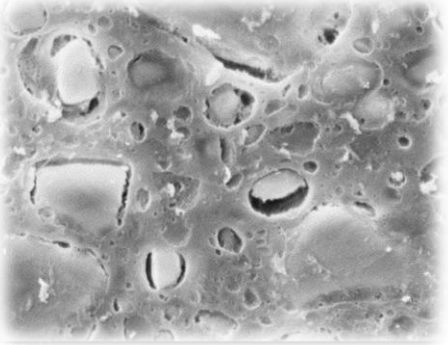




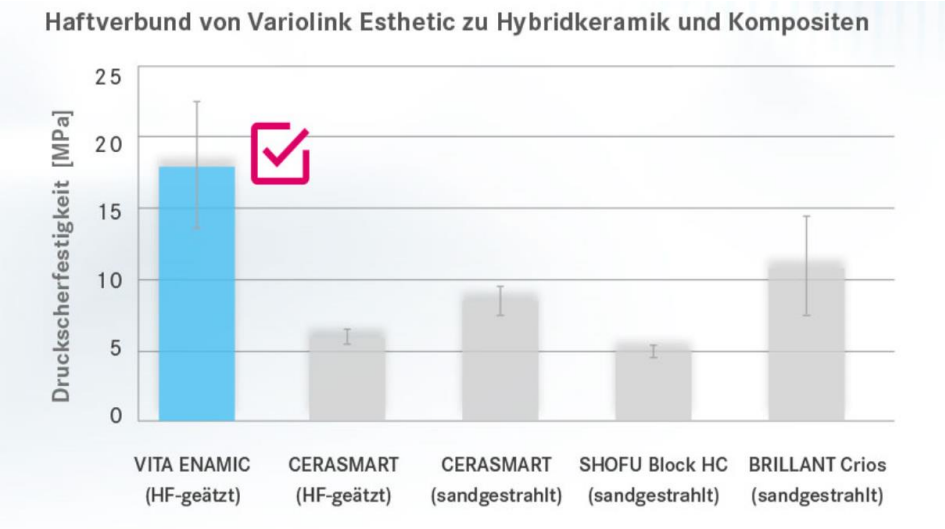
Composite: Polymer with
ceramic filler particles







All Ceramic Materials – Hybrid Ceramics





Haftverbund von Variolink Esthetic zu Hybridkeramik und Kompositen.

Dr. Berit Müller, Bad Säckingen, Deutschland

All Ceramic Materials – Hybrid Ceramics

Gewichtsverlust und Oberflächenrauigkeit nach Zahnbürstenabriebstest

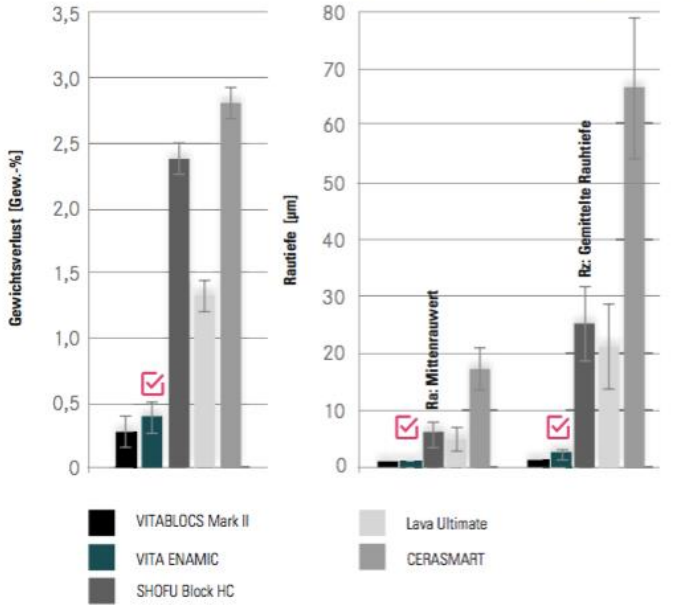


Abb. 1 Mittelwerte zu Gewichtsverlust und Oberflächenrauigkeit nach Zahnbürstenabrieb auf Basis von 5 Materialproben je Werkstoff. Je geringer die Kenngrößen Ra und Rz sind, desto glatter ist die Oberfläche.

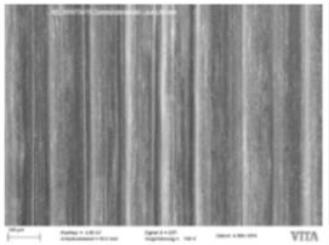


Abb.2a Lava Ultimate

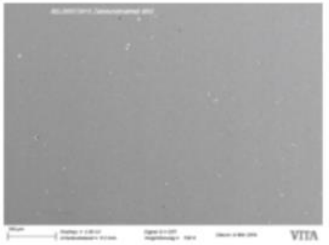


Abb.2d VITABLOCS Mark II

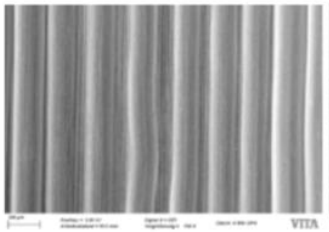


Abb.2b CERASMART



Abb.2e VITA ENAMIC

All Ceramic Materials – Hybrid Ceramics

Indication

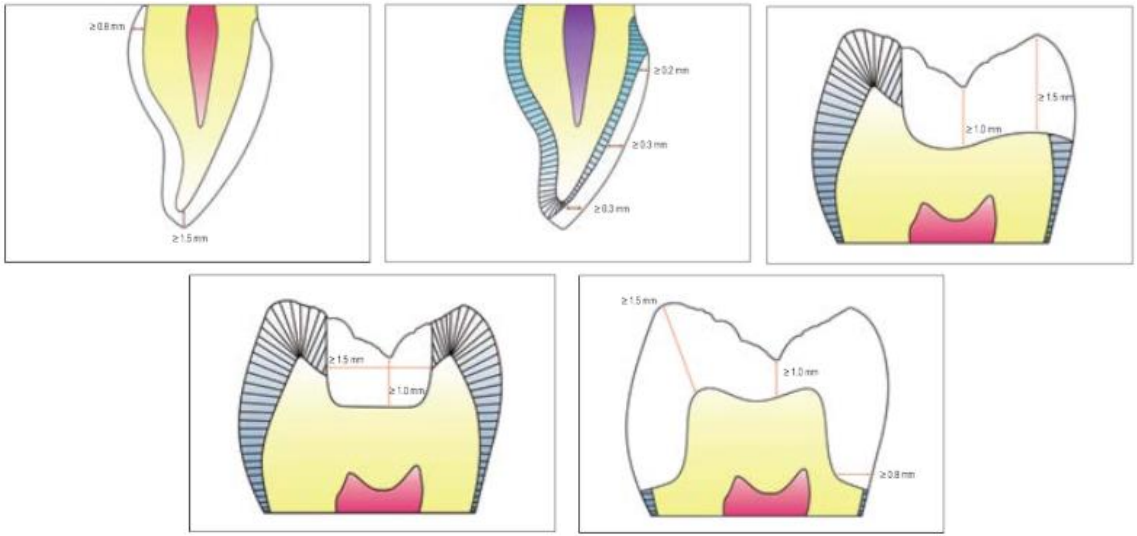
- Veneers
- Non prep Veneers
- Inlays
- Onlays
- Anteriour Crowns
- Posteriour Crowns
- Implant Crowns
- Functionel disorder



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All Ceramic Materials – Hybrid Ceramics

Preparation and ceramic layer thickness





VITA Zahnfabrik, Vita Enamic for CEREC®/inLab® Working Instructions, Issue 05.2014

All Ceramic Materials – Hybrid Ceramics



Hybrid Ceramic



Glass Ceramic



Feldspar Ceramic



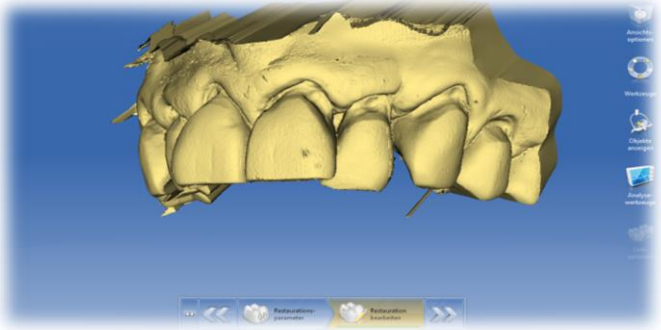


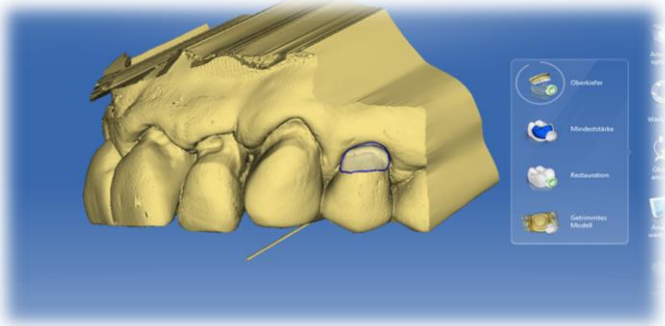
All Ceramic Materials – Hybrid Ceramics

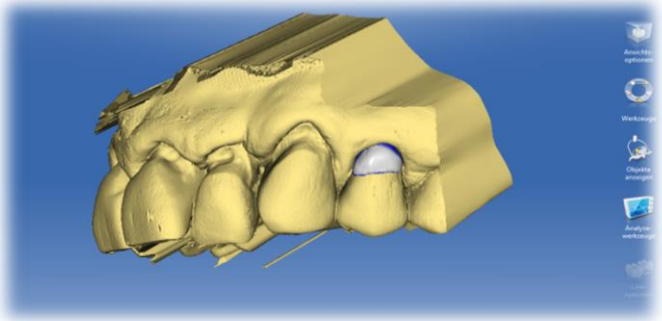


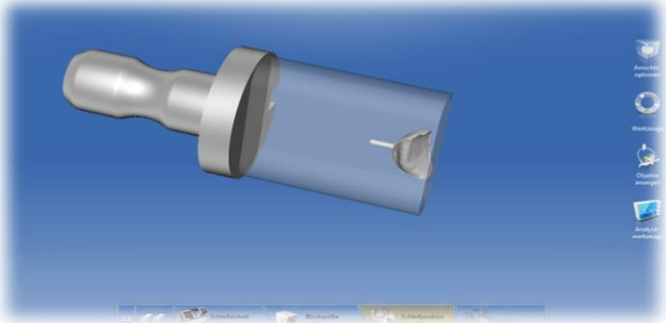
Dr. G. Werling, Bellheim, Germany

All Ceramic Materials – Hybrid Ceramics











Dr. G. Werling, Bellheim, Germany

All Ceramic Materials – Hybrid Ceramics



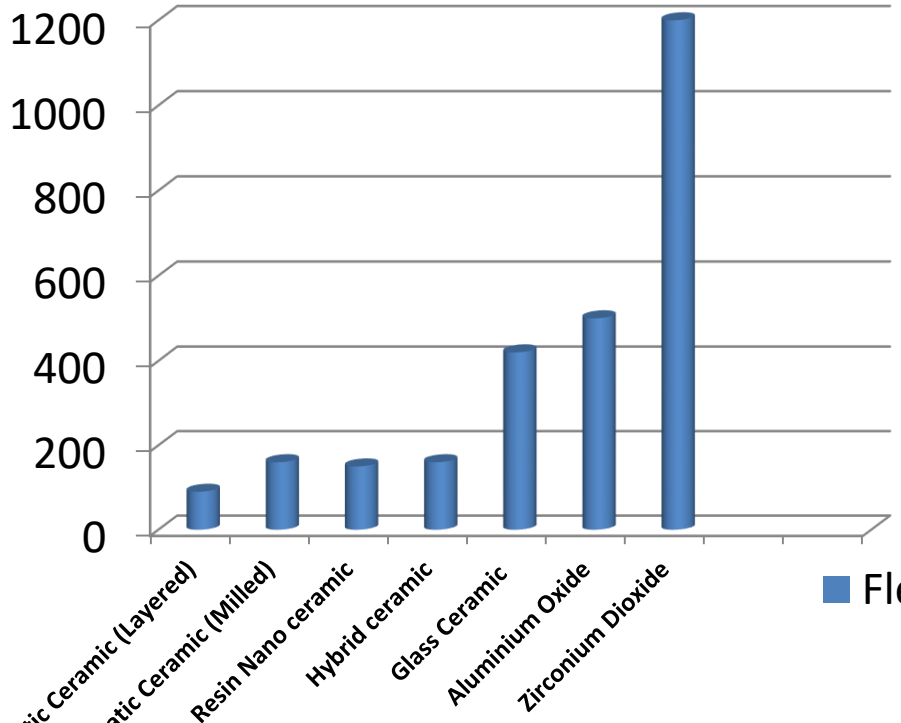




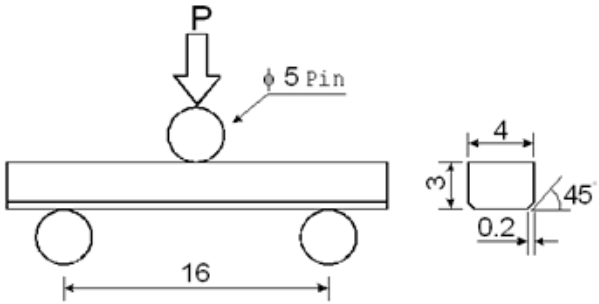
Dr. G. Werling, Bellheim, Germany

Dr. G. Werling, Bellheim, Germany

All Ceramic Materials – Hybrid Ceramics







All Ceramic Materials – Hybrid Ceramics

Full-adhesive resin cement

- Adiva F – Vita Zahnfabrik
- Panavia V5 – Kuraray
- Panavia F2.0 – Kuraray
- Relyx Ultimate – 3M Espe
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Self-adhesive resin cement

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- Speedcem Plus – Ivoclar
- Maxcem Elite – Kerr
- Bifix SE – Voco
- Solocem – Coltene



Resin-modified glass ionomer cement

- Not Allowed



All Ceramic Materials – Hybrid Ceramics

Crown, Inlay, Onlay & Veneer (Full-Adhesive)

- The restoration is pretreated
  - Etched with hydrofluoric acid (5%) for 60 Sec
  - Conditioned (60sec) with a ceramic-primer
- The preparation is isolated and cleaned
  - Polishing brush and cleaning paste free of oil and fluoride
- Apply phosphoric acid gel onto the enamel (for 15 -30sec)
- Rinse with water min. 5sec and dry with compressed air
  - Enamel surfaces appear chalky white
- Apply Self-etching adhesive the tooth surface, wait for 15sec
- Disperse the adhesive with oil- and moisture-free compressed air
  - a glossy, immobile film layer results
- (Option) Light-cure the adhesive for 10sec (Min. 500 mW/cm^2)
- Fill the restoration with adhesive composite cement
  - Light-cure 2sec / quarter with max. distance of 10mm
- Remove excess luting material and cover the margins with glycerine gel
  - Light-cure 20sec/quarter (Min. 1100 mW/cm^2)
- Wait for 5min. biting on a cotton roll.

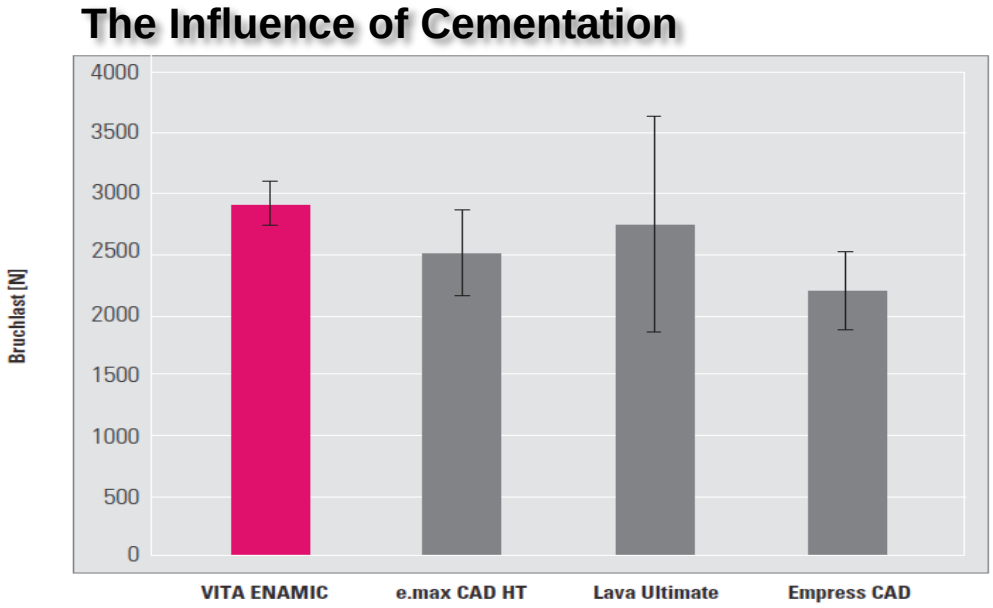
Crown (Self Adhesive)



- The restoration is pretreated
  - Etched with hydrofluoric acid (5%) for 60 Sec
  - Conditioned (60sec) with a ceramic-primer
- The preparation is isolated and cleaned
  - Polishing brush and cleaning paste free of oil and fluoride
- Fill the restoration with adhesive composite cement
  - Light-cure 2sec / quarter with max. distance of 10mm
- Remove excess luting material and cover the margins with glycerine gel
  - Light-cure 20sec/quarter (Min. 1100 mW/cm^2)
- Wait for 5min. biting on a cotton roll.



All Ceramic Materials – Hybrid Ceramics





Source: VITA R&D; Test: molar crowns, hybrid ceramic dies (E-modulus similar to dentin) cemented with RelyX Unicem, stored and statically loaded until fracture occurred!

All Ceramic Materials – Hybrid Ceramics



Dr. Sjoerd Smeekens, Beuningen, Netherlands





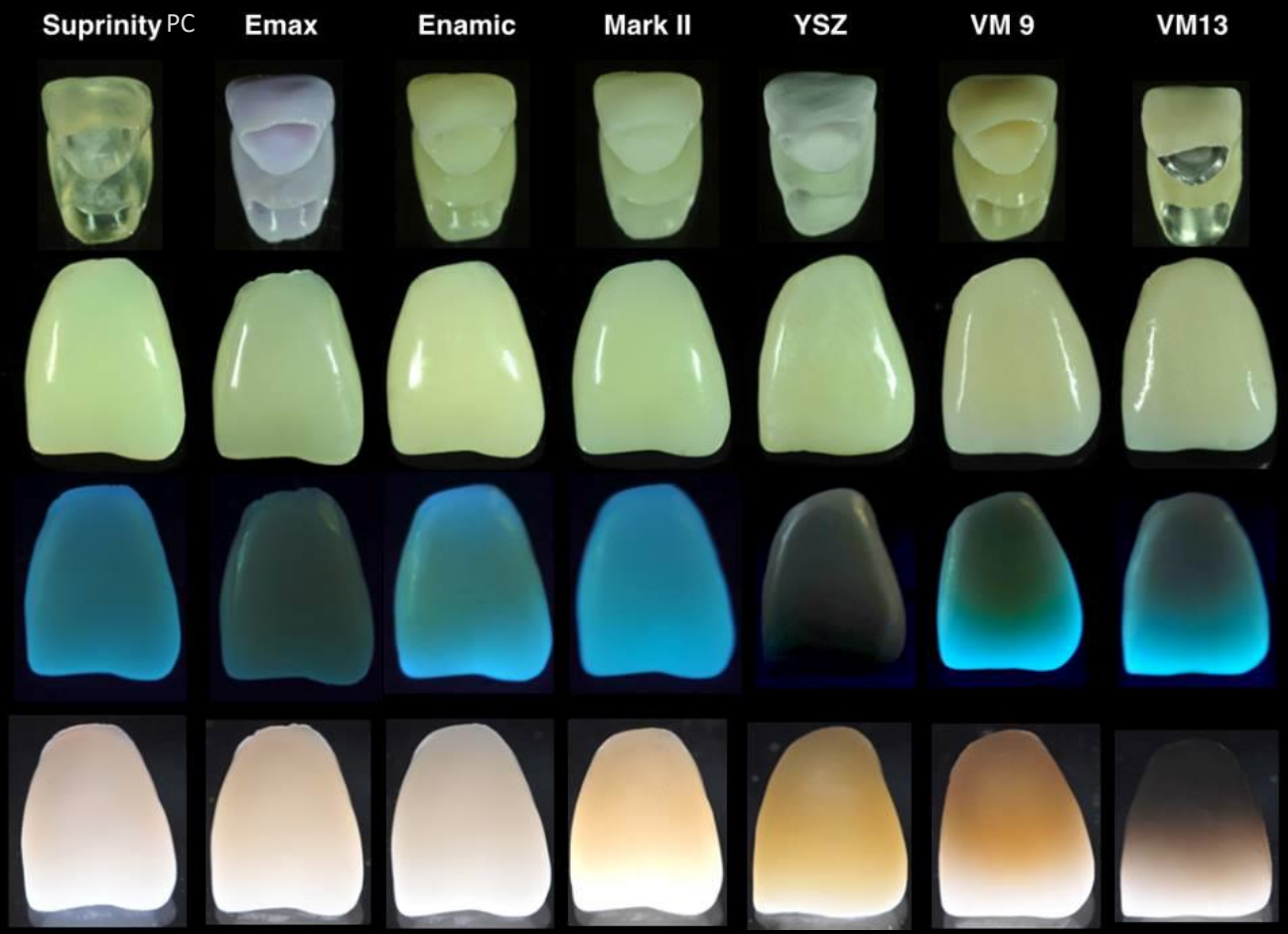




VITA



VITA



ZTM Vanik Kaufmann-Jinoian, Switserland

All Ceramic Materials – Hybrid Ceramics

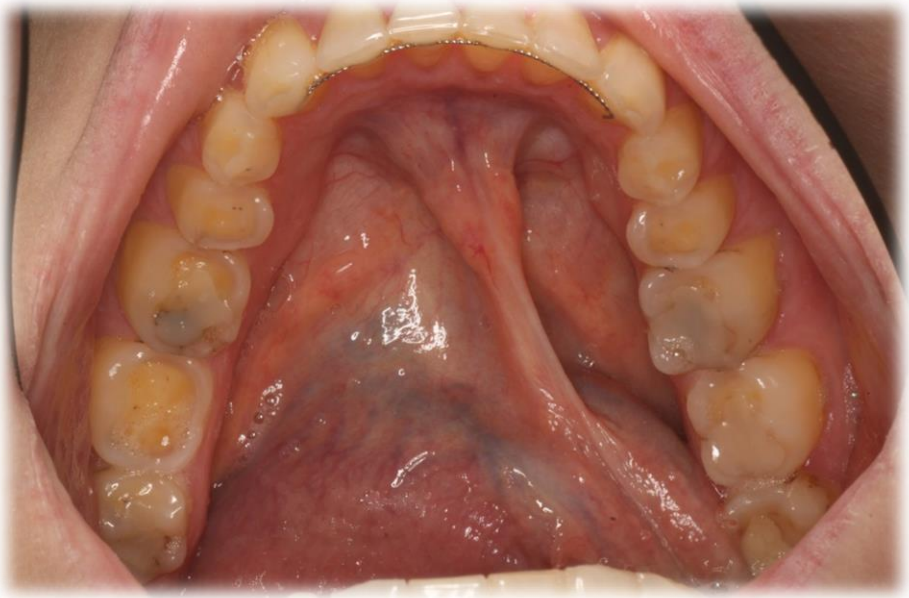


Dr Amée Swart, Alkmaar, Netherlands



All Ceramic Materials – Hybrid Ceramics

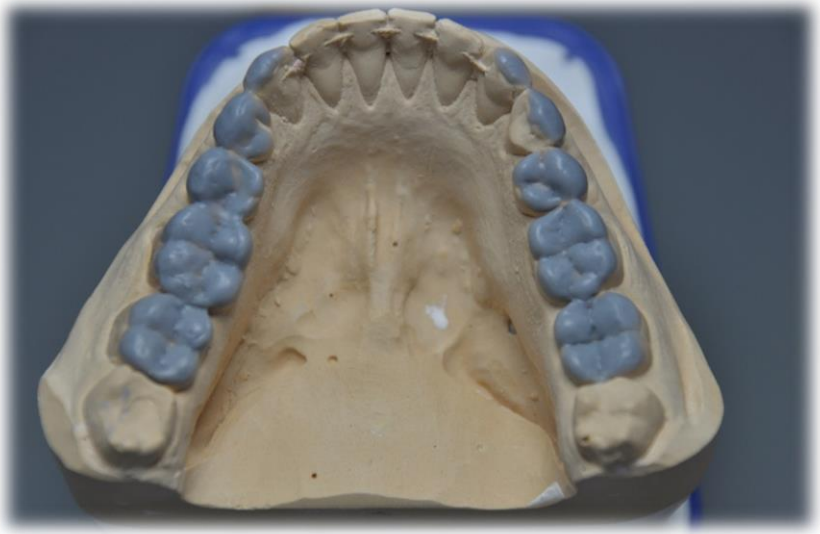




Dr Amée Swart, Alkmaar, Netherlands

All Ceramic Materials – Hybrid Ceramics

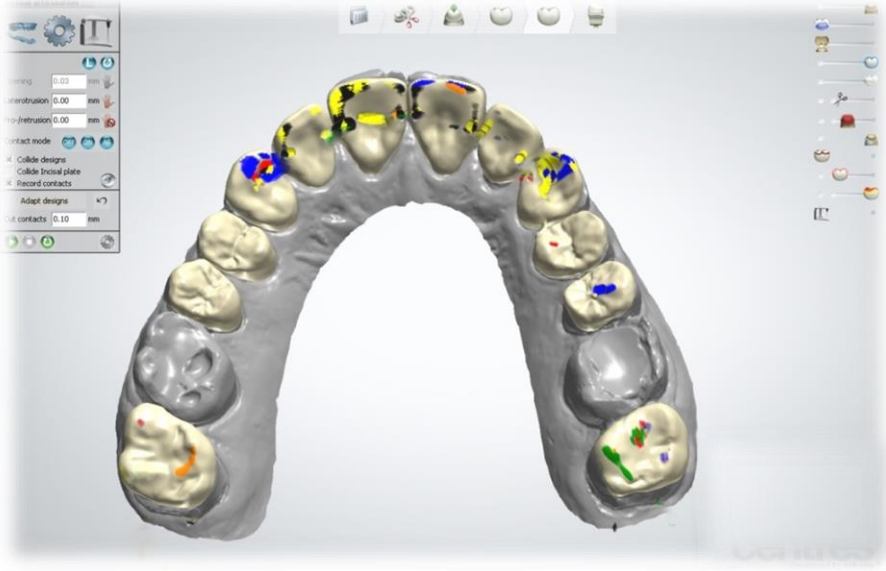




Dr Amée Swart, Alkmaar, Netherlands

All Ceramic Materials – Hybrid Ceramics





Dr Amée Swart, Alkmaar, Netherlands

All Ceramic Materials – Hybrid Ceramics

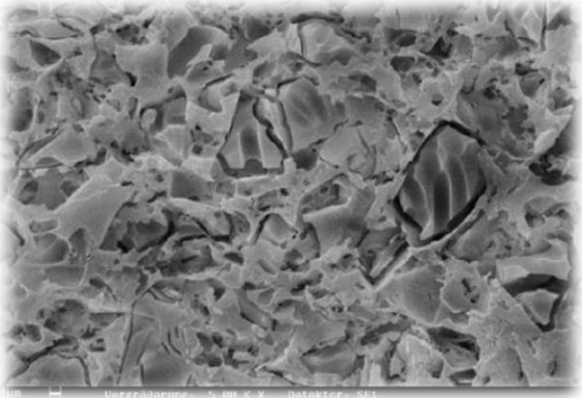


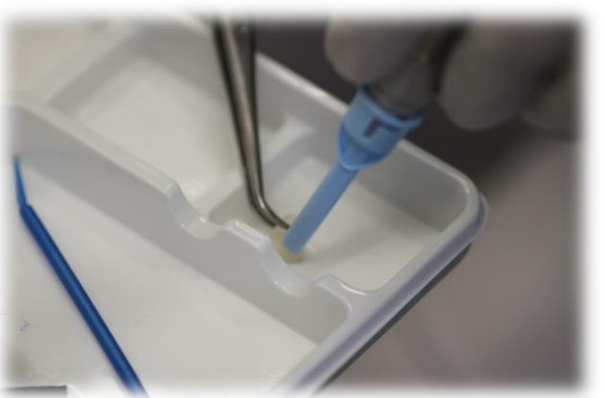


Dr Amée Swart, Alkmaar, Netherlands

All Ceramic Materials – Hybrid Ceramics







Dr Amée Swart, Alkmaar, Netherlands

All Ceramic Materials – Hybrid Ceramics



Dr Amée Swart, Alkmaar, Netherlands

All Ceramic Materials – Hybrid Ceramics





Dr Amée Swart, Alkmaar, Netherlands

All Ceramic Materials – Hybrid Ceramics



Dr Amée Swart, Alkmaar, Netherlands

All Ceramic Materials – Hybrid Ceramics



Dr Amée Swart, Alkmaar, Netherlands

All Ceramic Materials – Hybrid Ceramics



Dr Amée Swart, Alkmaar, Netherlands

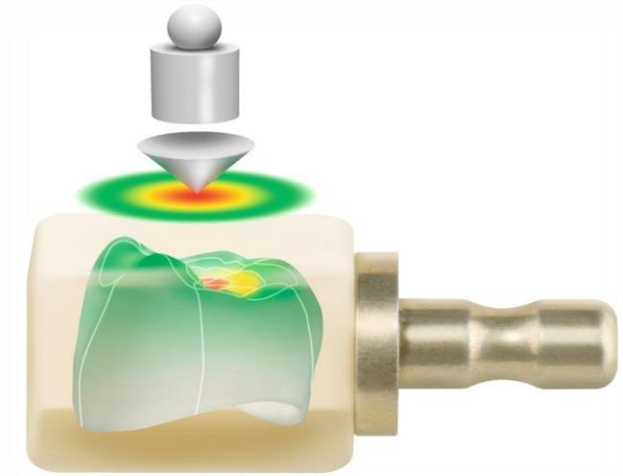
All Ceramic Materials – Hybrid Ceramics



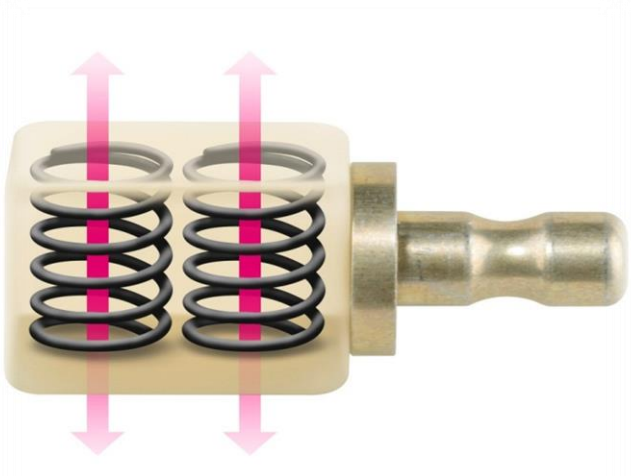




All Ceramic Materials – Hybrid Ceramics

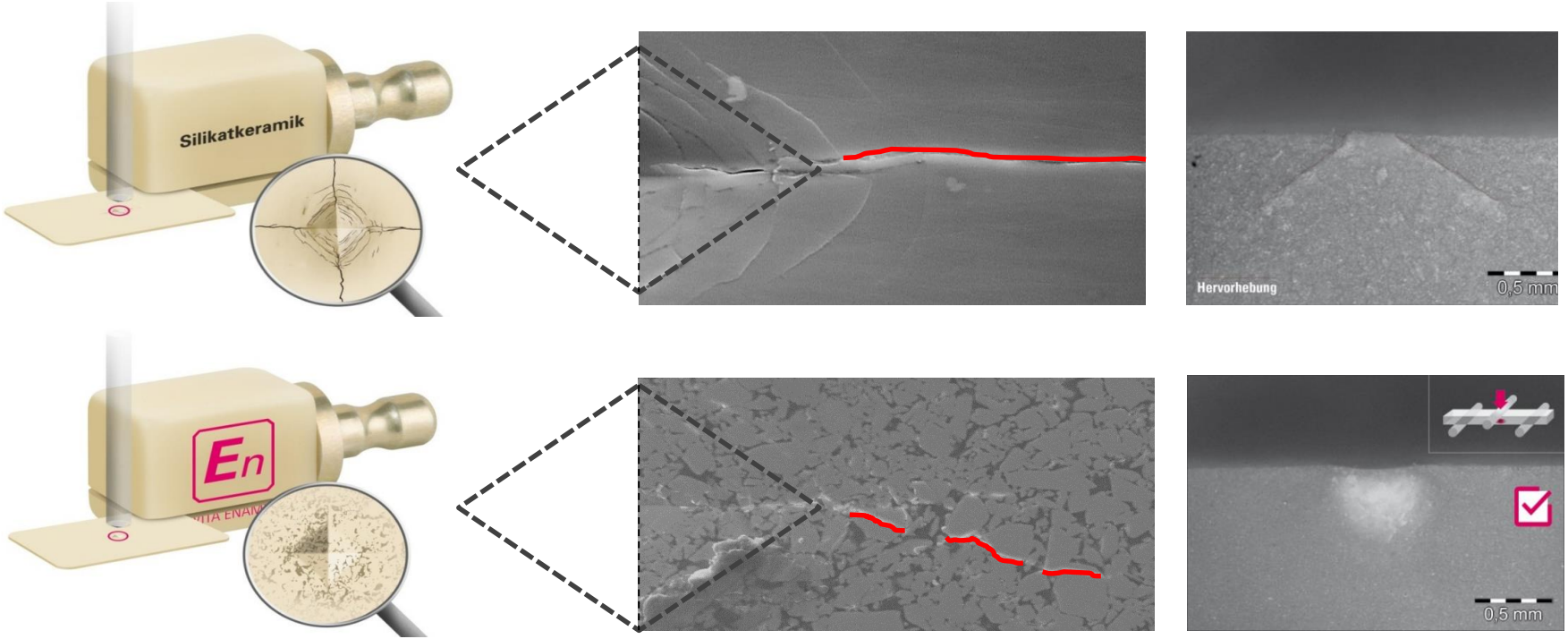


Optimal force distribution



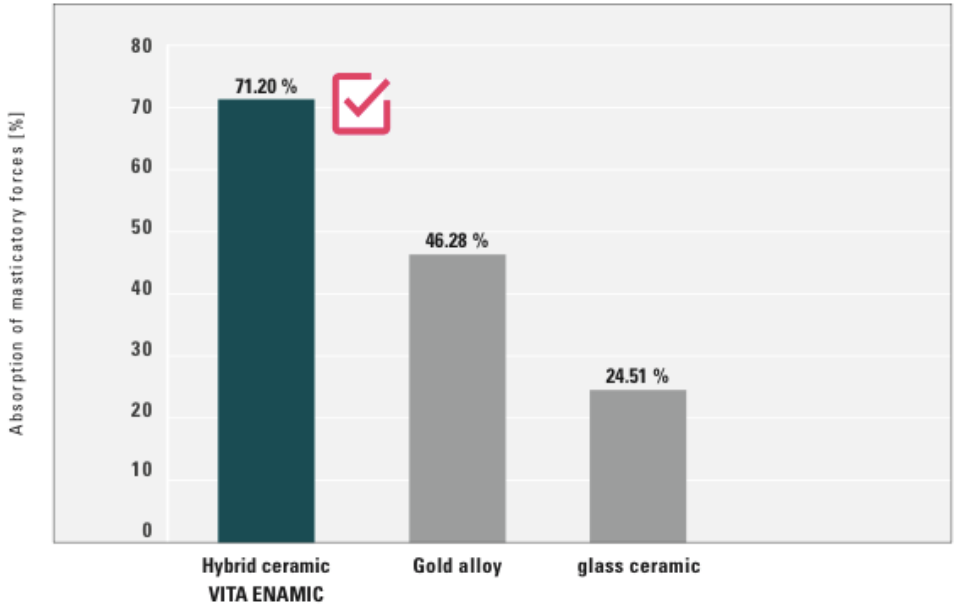
Integrated buffer function

All Ceramic Materials – Hybrid Ceramics

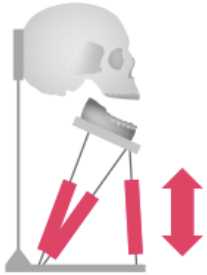


All Ceramic Materials – Hybrid Ceramics

Absorption of masticatory forces compared to zirconia (ZrO_2)



Material class	Modulus of elasticity [GPa]	Force transmission (N)	Absorption of forces (%) compared to ZrO_2
Zirconia	210 GPa	641.8 N (SD 6.8)	
glass ceramic	96 GPa	484.5 N (SD 5.5)	-24.51 %
Gold alloy	77 GPa	344.8 N (SD 5.7)	-46.28 %
VITA ENAMIC hybrid ceramic	30 GPa	184.9 N (SD 3.9)	-71.20 %



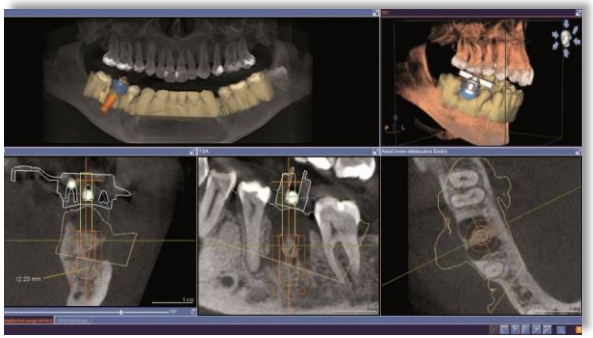
Source: University of Genoa, Department for fixed and implant-prosthetic restorations, Dr. Maria Menini et al., Genoa, Italy ([8], cf. p. 35)

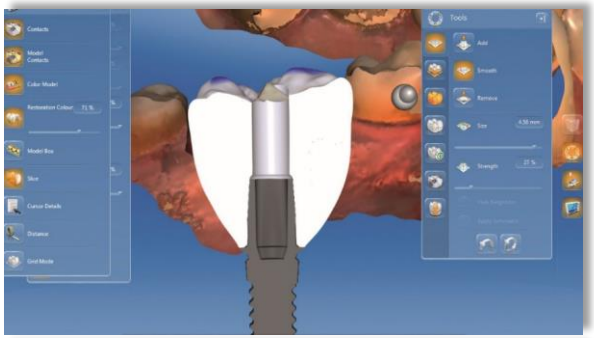
All Ceramic Materials – Hybrid Ceramics



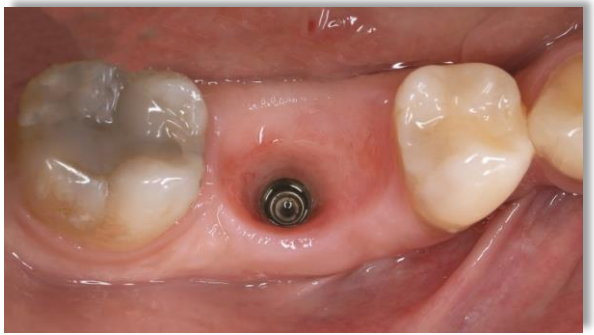
Dr. DeLuca, São Paulo,Brazil

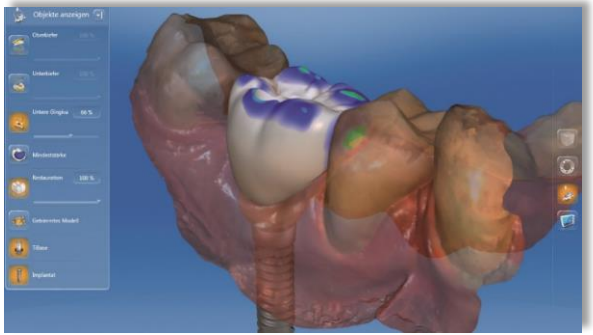
All Ceramic Materials – Hybrid Ceramics













Dr. Andreas Kurbad, Germany

All Ceramic Materials – Hybrid Ceramics





All Ceramic Materials – Hybrid Ceramics







Dr. Andreas. Kurbad, Germany

All Ceramic Materials – Hybrid Ceramics

Advantages

- Natural flexibility
- Shock Absorbing
- Crack resistant
- Natural Abrasion
- Multiple Indication
- Minimal invasive preparation
- Easy to repair

Disadvantages

- No conventionel bonding
- Limited individualistion

Recommondation: **Ideal for Posteriour- & Implant crowns, functionel disorder, minimal invasive- & non-prep restorations**

All Ceramic Materials – Glass Ceramics



All Ceramic Materials – Glass Ceramics







ZTM Igor Knyazev, Moskow, Russia

All Ceramic Materials – Glass Ceramics



1st Generation

- Empress 1&2 — Leucit-Glass Ceramic, Ivoclar-Vivadent GmbH

2th Generation

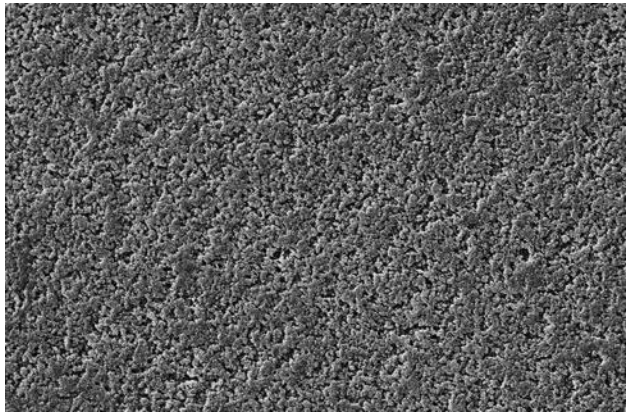
- Emax Cad — Lithium Disilicat, Ivoclar-Vivadent GmbH

3th Generation

- Suprinity PC — Zirconia reinforced Lithium Silicat, Vita Zahnfabrik GmbH
- Celtra Duo — Zirconia reinforced Lithium Silicat, Sirona - Dentsply GmbH
- N!ce — Alumina reinforced Lithium Silicat, Straumann

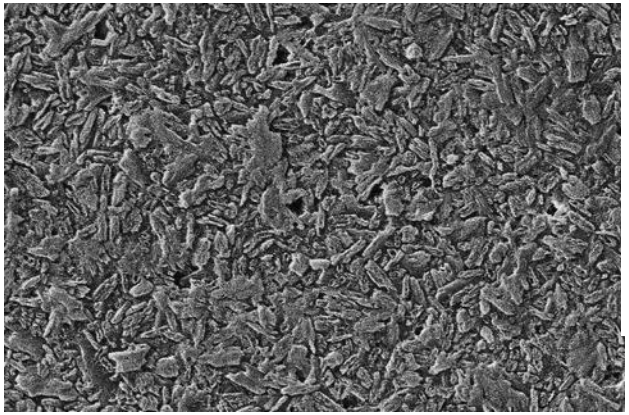
All Ceramic Materials – Glass Ceramics





Zirconia reinforced Glass Ceramic

Magnification x10,000;
Source: VITA R&D



Trad. glass ceramic
(here: lithium disilicate)

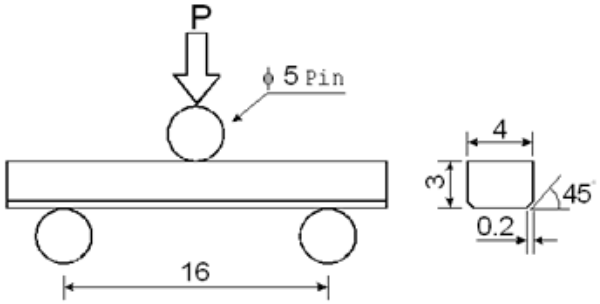
Magnification x10,000;
Source: VITA R&D

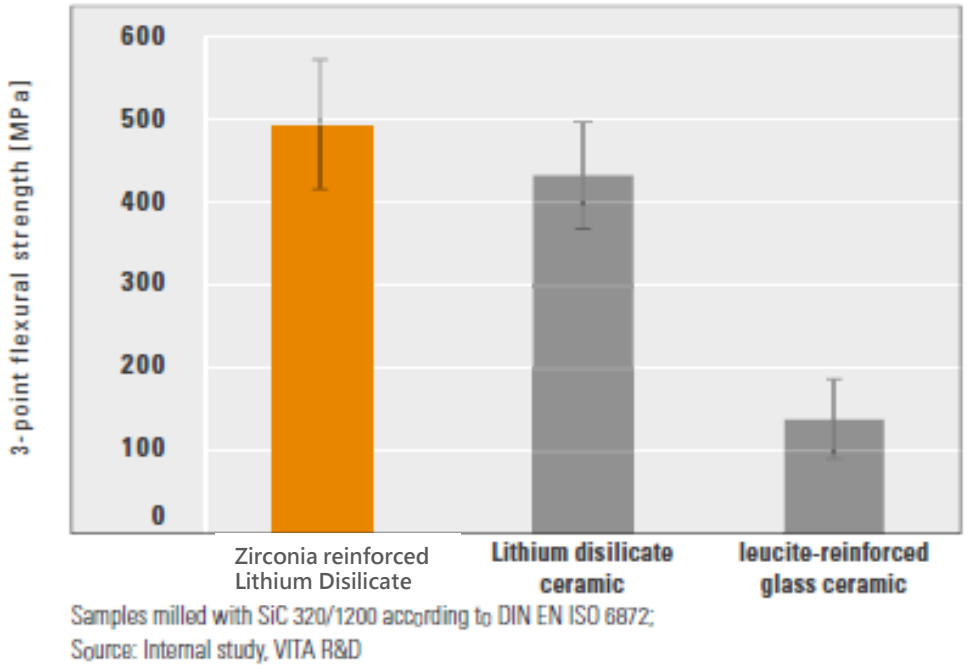


All Ceramic Materials – Glass Ceramics

3-Point Flexural strength after milling





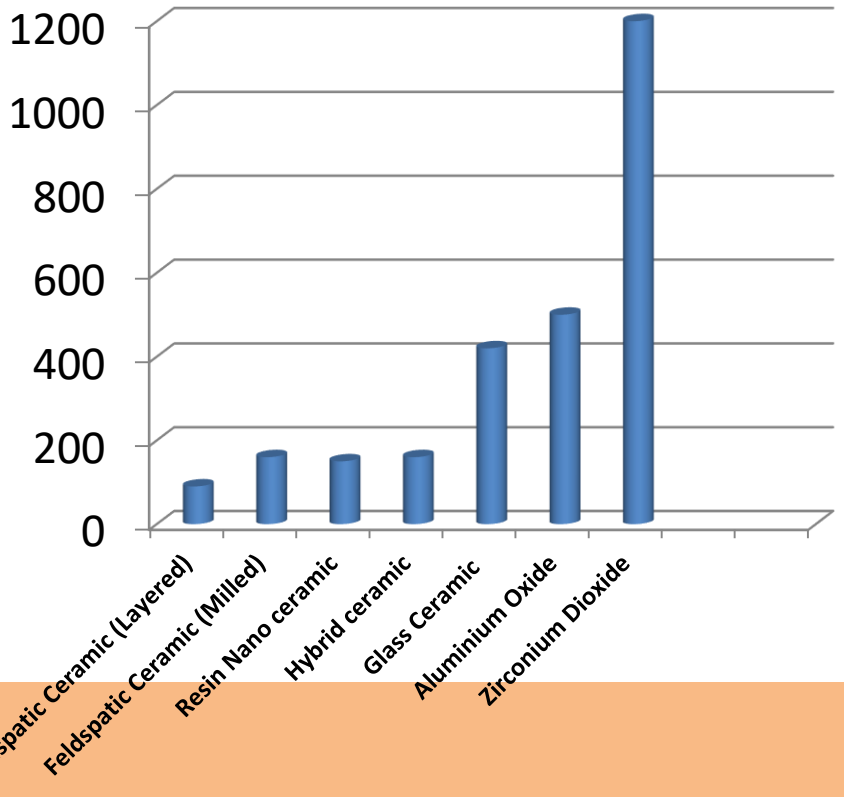


Samples milled with SiC 320/1200 according to DIN EN ISO 6872;
Source: Internal study, VITA R&D

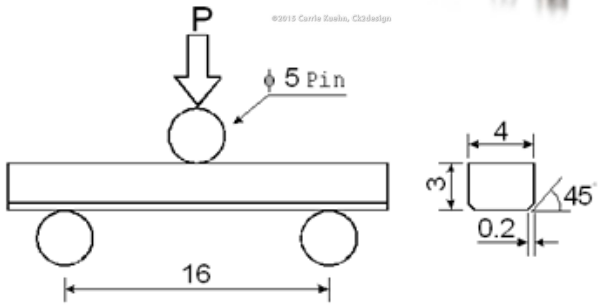
All Ceramic Materials – Glass Ceramics



All Ceramic Materials – Glass Ceramics







All Ceramic Materials – Glass Ceramics

Full-adhesive resin cement

- Adiva F – Vita Zahnfabrik
- Panavia V5 – Kuraray
- Panavia F2.0 – Kuraray
- Relyx Ultimate – 3M Espe
- G.Sem Linkforce – GC
- Variolink Esthetic – Ivoclar
- Multilink Automix – Ivoclar
- Nexus 3 (3th Gen.) – Kerr



Self-adhesive resin cement

- Adiva S – Vita Zahnfabrik
- Panavia SA Cement Plus – Kuraray
- Relyx Unicem 2 – 3M Espe
- G.Sem Linkace – GC
- Speedcem Plus – Ivoclar
- Maxcem Elite – Kerr
- Bifix SE – Voco
- Solocem – Coltene



Resin-modified glass ionomer cement

- Not recommended



All Ceramic Materials – Glass Ceramics

Crown, Inlay, Onlay & Veneer (Full-Adhesive)

- The restoration is pretreated
  - Etched with hydrofluoric acid (5%) for 20 Sec
  - Conditioned (60sec) with a ceramic-primer
- The preparation is isolated and cleaned
  - Polishing brush and cleaning paste free of oil and fluoride
- Apply phosphoric acid gel onto the enamel (for 15 -30sec)
- Rinse with water min. 5sec and dry with compressed air
  - Enamel surfaces appear chalky white
- Apply Self-etching adhesive the tooth surface, wait for 15sec
- Disperse the adhesive with oil- and moisture-free compressed air
  - a glossy, immobile film layer results
- (Option) Light-cure the adhesive for 10sec (Min. 500 mW/cm^2)
- Fill the restoration with adhesive composite cement
  - Light-cure 2sec / quarter with max. distance of 10mm
- Remove excess luting material and cover the margins with glycerine gel
  - Light-cure 20sec/quarter (Min. 1100 mW/cm^2)
- Wait for 5min. biting on a cotton roll.

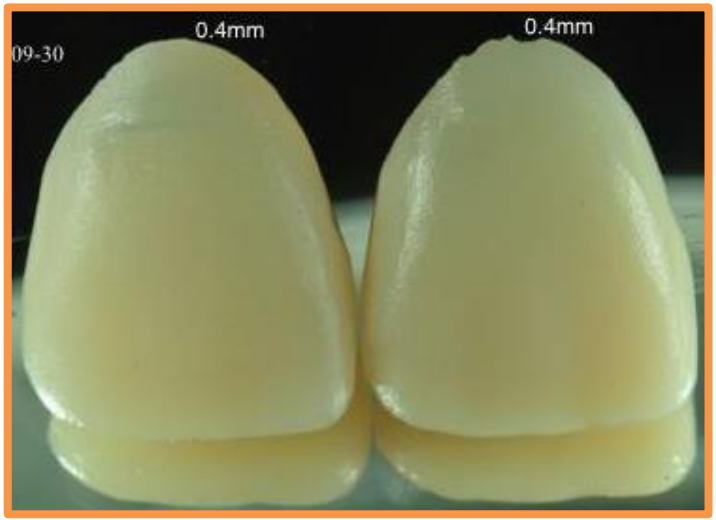
Crown (Self Adhesive)

- The restoration is pretreated
  - Etched with hydrofluoric acid (5%) for 20 Sec
  - Conditioned for 60sec with a ceramic-primer
- The preparation is isolated and cleaned
  - Polishing brush and cleaning paste free of oil and fluoride
- Fill the restoration with adhesive composite cement
  - Light-cure 2sec / quarter with max. distance of 10mm
- Remove excess luting material and cover the margins with glycerine gel
  - Light-cure 20sec/quarter (Min. 1100 mW/cm^2)
- Wait for 5min. biting on a cotton roll.

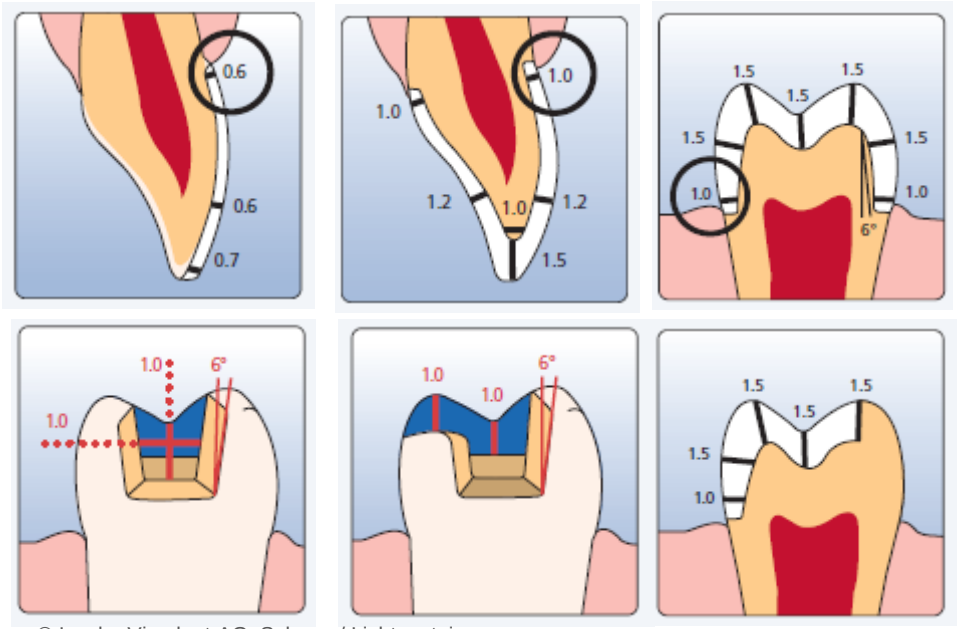


All Ceramic Materials – Glass Ceramics

Preparation and ceramic layer thickness



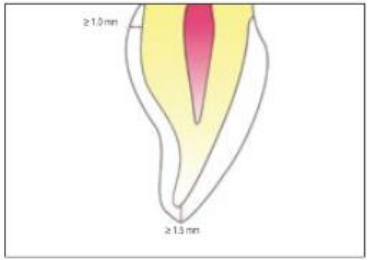
ZTM Vanik Kaufmann-Jinoian, Switserland

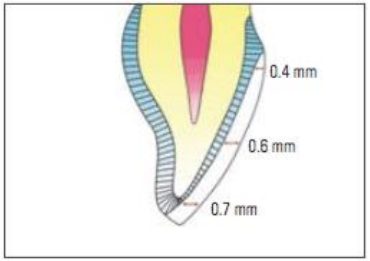


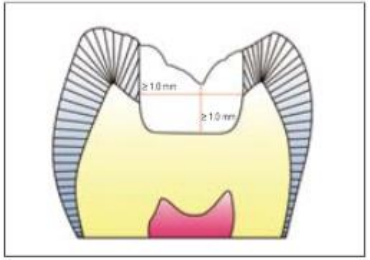
® Ivoclar Vivadent AG, Schaan / Lichtenstein

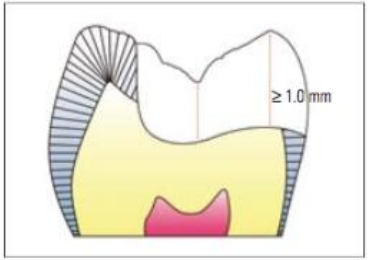
All Ceramic Materials – Glass Ceramics

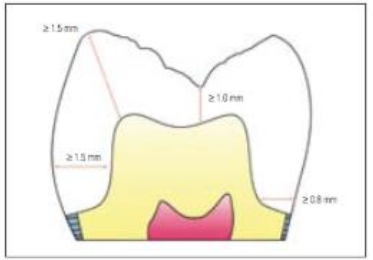
Preparation and ceramic layer thickness











VITA Zahnfabrik, Vita Suprinity PC for CEREC®/inLab® Working Instructions, Issue 05.2016

All Ceramic Materials – Glass Ceramics

Indication

- Veneers
- Inlays
- Onlays
- Anteriour Crowns
- Posteriour Crowns
- Abutments
- Maryland Bridges
- Three Unit Anteriour bridges



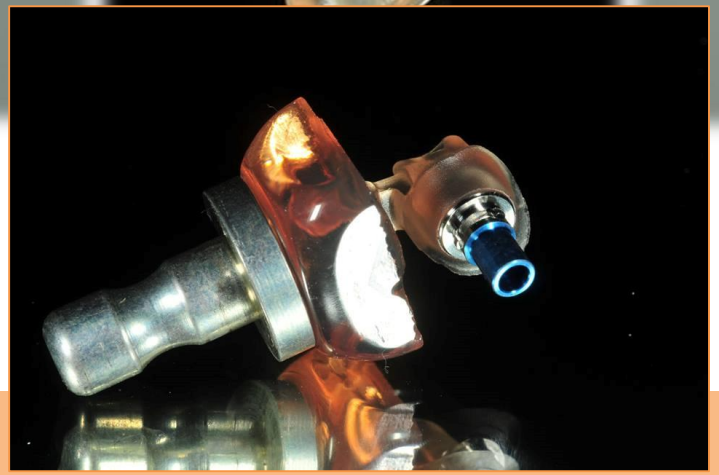
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All Ceramic Materials – Glass Ceramics



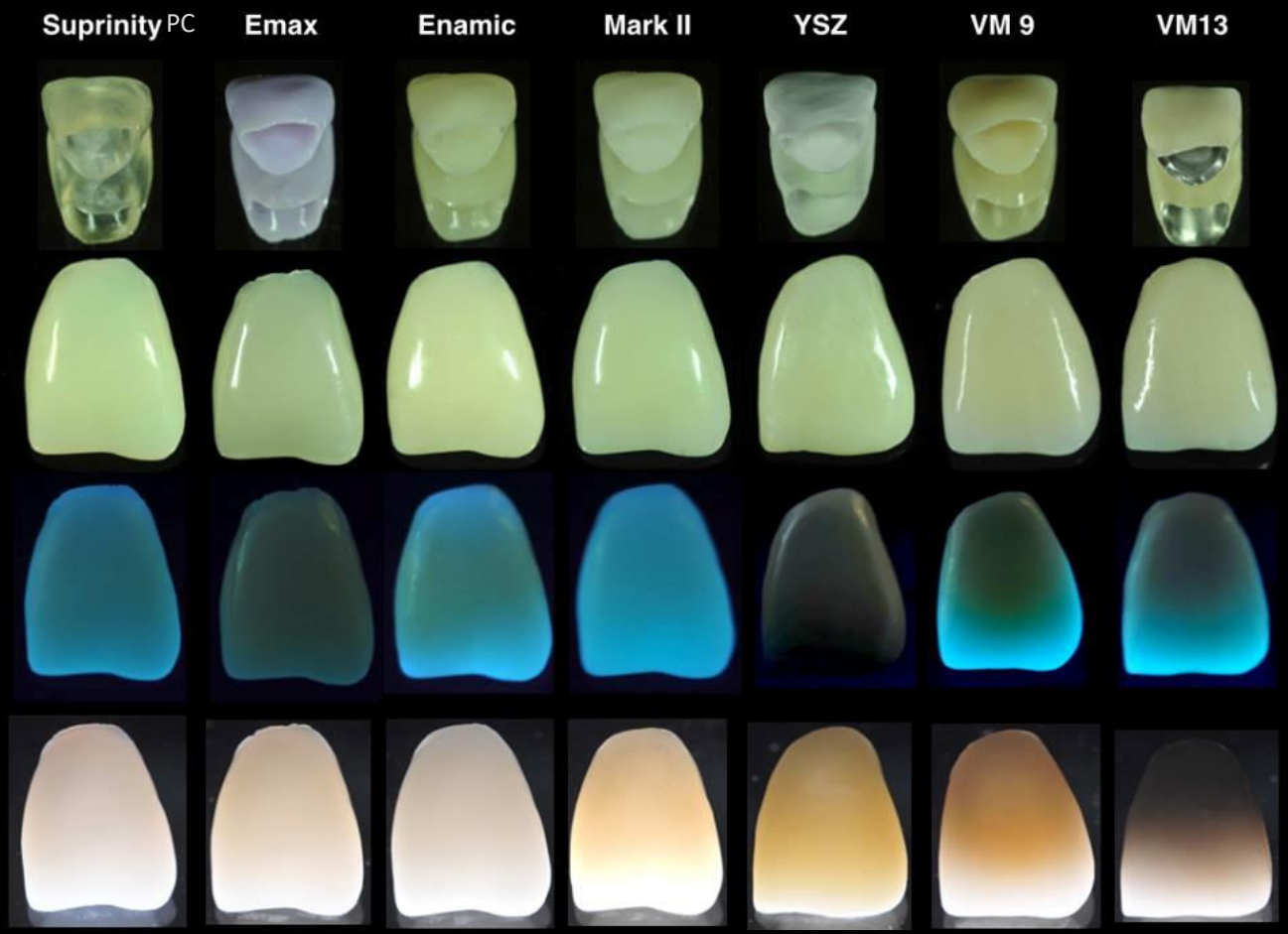






ZTM Vanik Kaufmann-Jinoian, Switserland

VITA



ZTM Vanik Kaufmann-Jinoian, Switserland

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All Ceramic Materials – Glass Ceramics



Dr. Prinja, Bangkok, Thailand





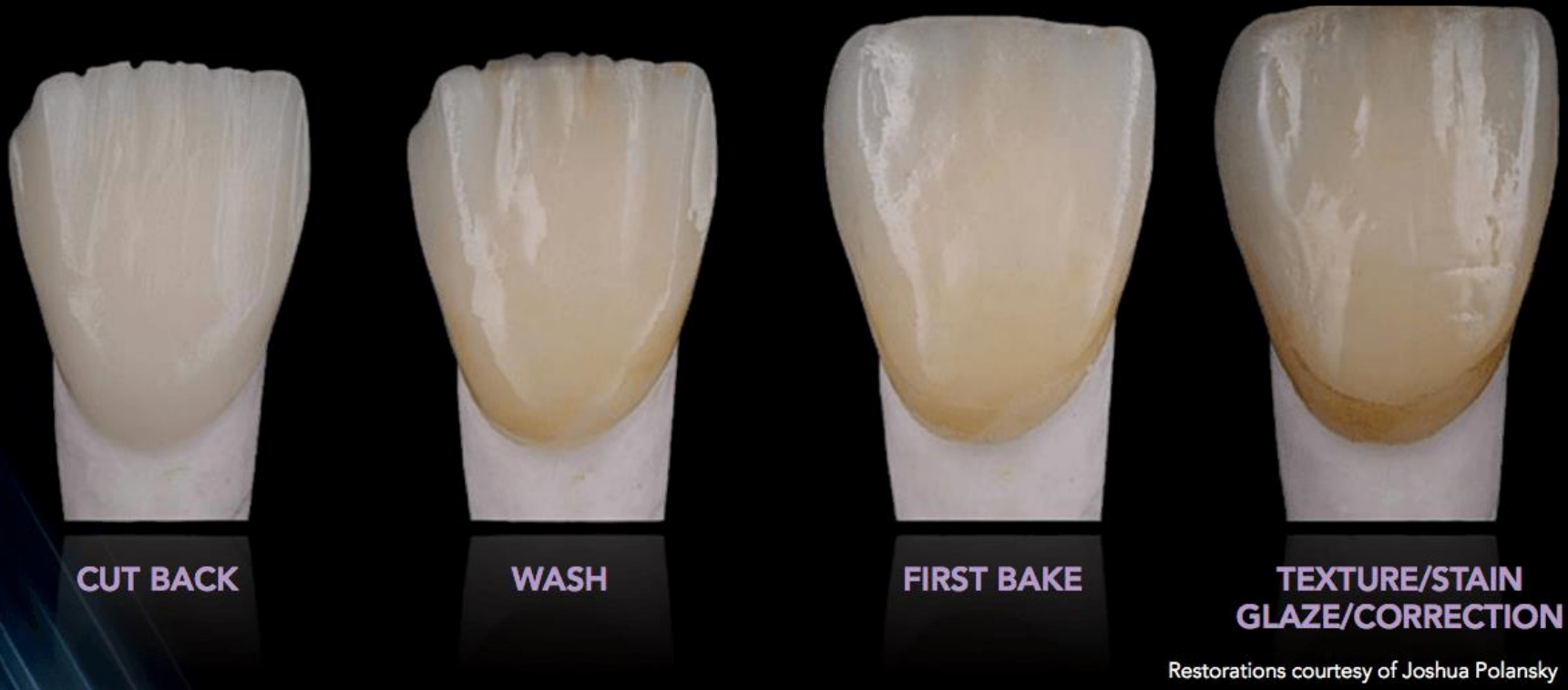
All Ceramic Materials – Glass Ceramics



Dr. Prinja, Bangkok, Thailand

VITA

All Ceramic Materials – Glass Ceramics



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Dental Atelier, Warszawa, Poland









Dental Atelier, Warszawa, Poland

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Dental Atelier, Warszawa, Poland

All Ceramic Materials – Glass Ceramics

Advantages

- High Aesthetics
- Natural Opalescence
- High Flexural Strength
- Multiple Indication
- Conventionel Bonding
- Cut-back or monolithic
- +/- 10 Years Experience

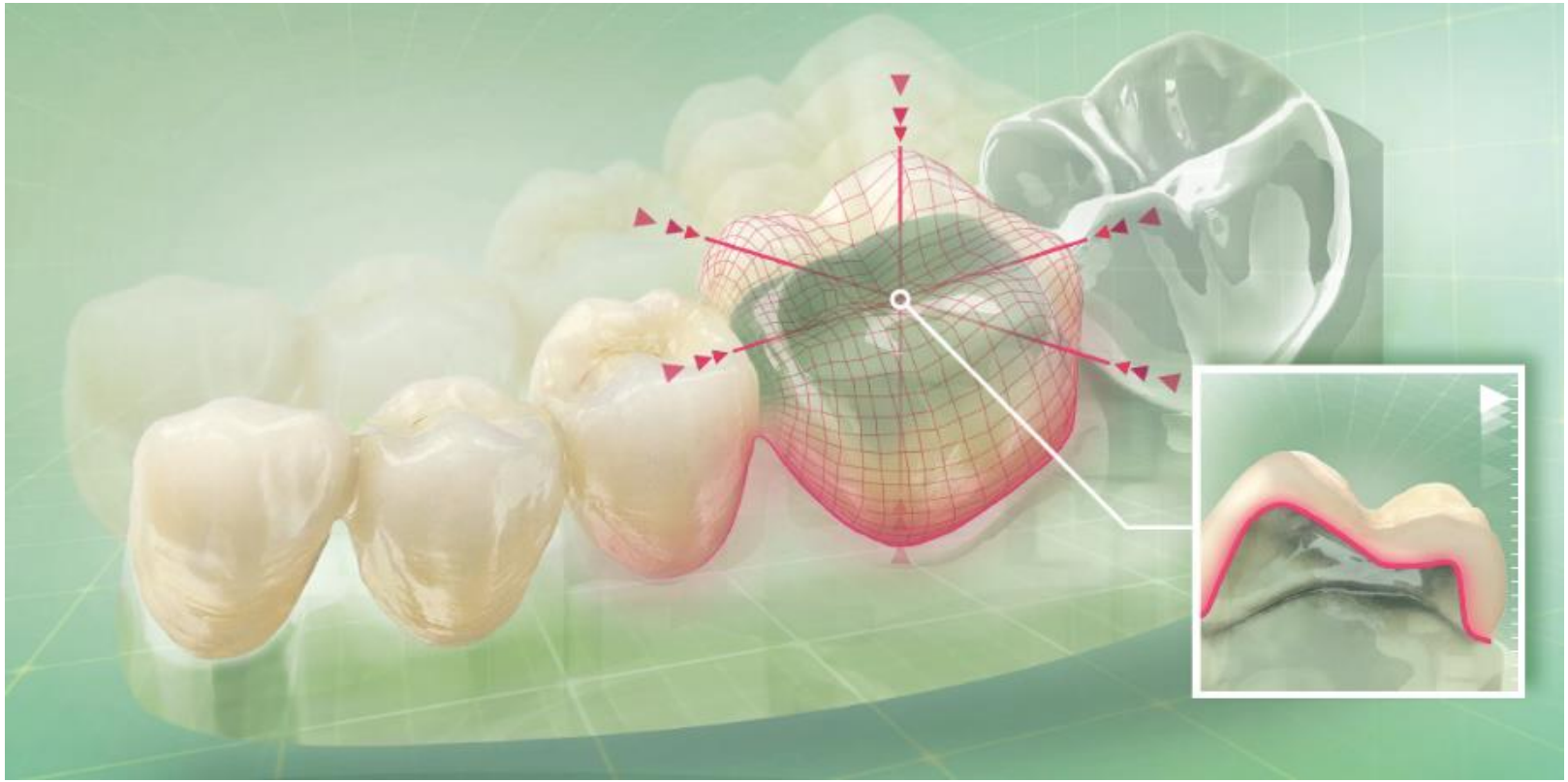
Disadvantages

- Brittle Ceramic
- Minimal Wall-Thickness
- Conventionel Preparation
- Difficult to repair



Recommondation: **Ideal for single Anterior Restorations and 3-unit bridges**

VITA All Ceramic Materials – Zirconium Dioxide



All Ceramic Materials – Zirconium Dioxide









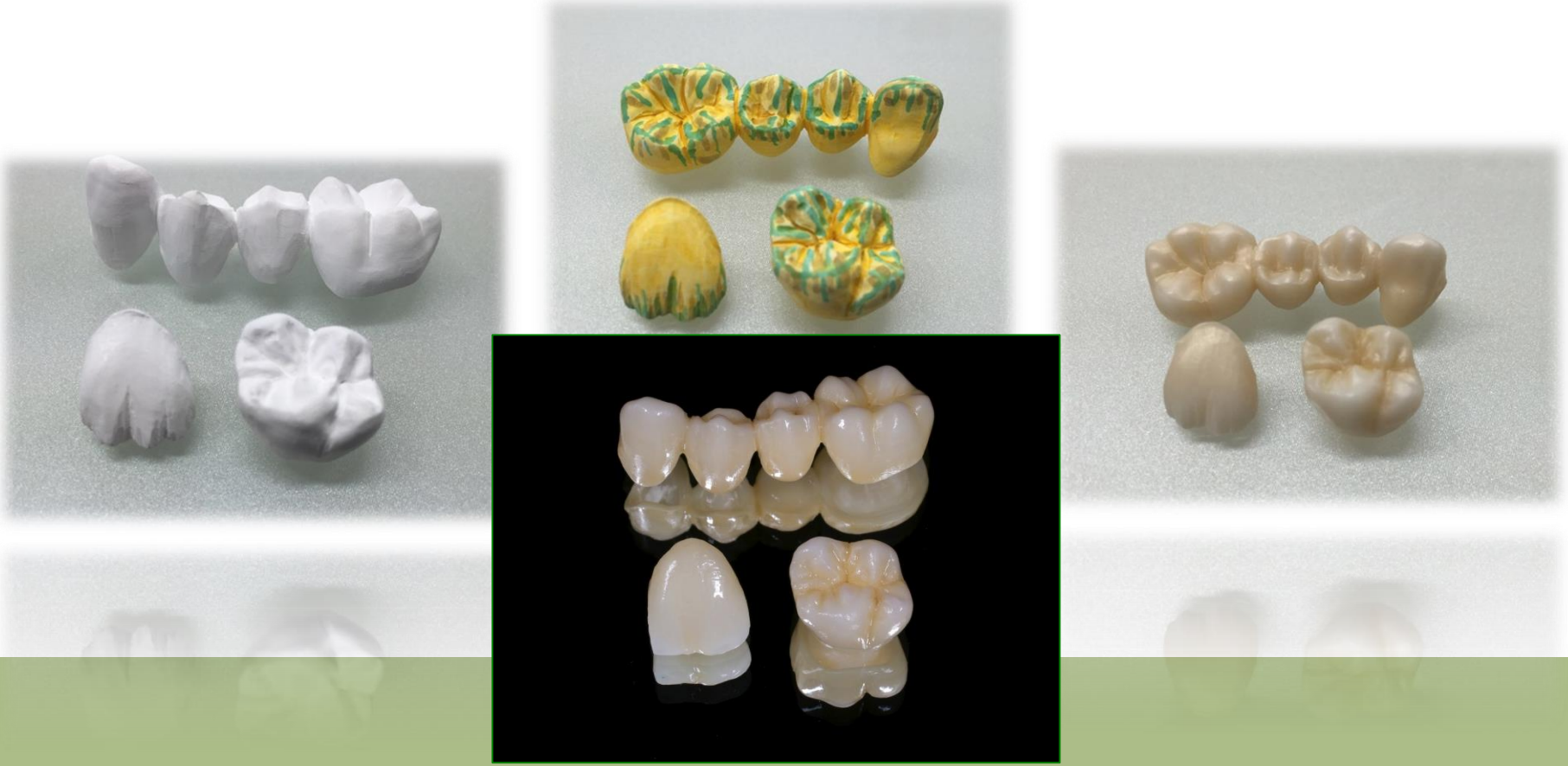
ZT Dominique Behaeghel, Belgium

Dr. G.Peuvrel, Lille, France.

All Ceramic Materials – Zirconium Dioxide



All Ceramic Materials – Zirconium Dioxide

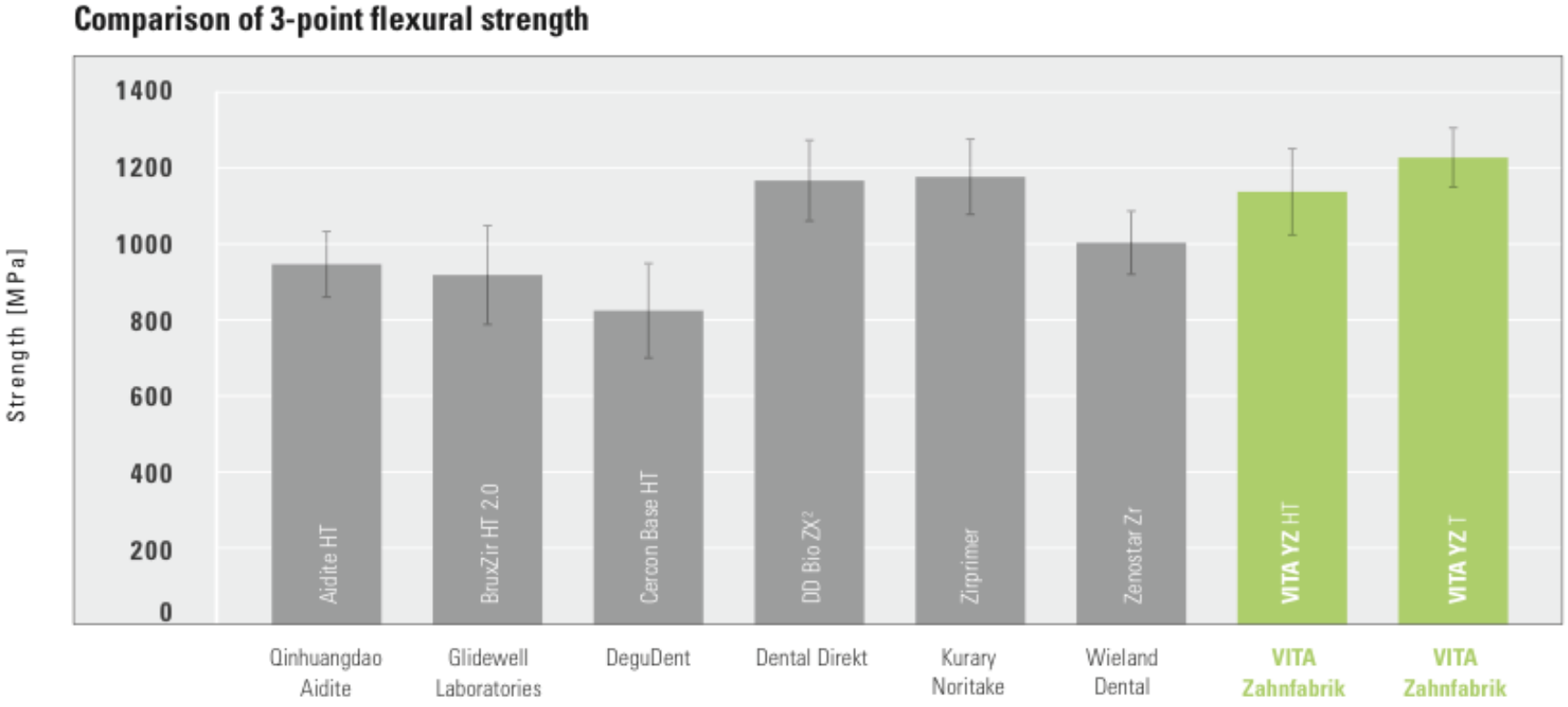


All Ceramic Materials – Zirconium Dioxide

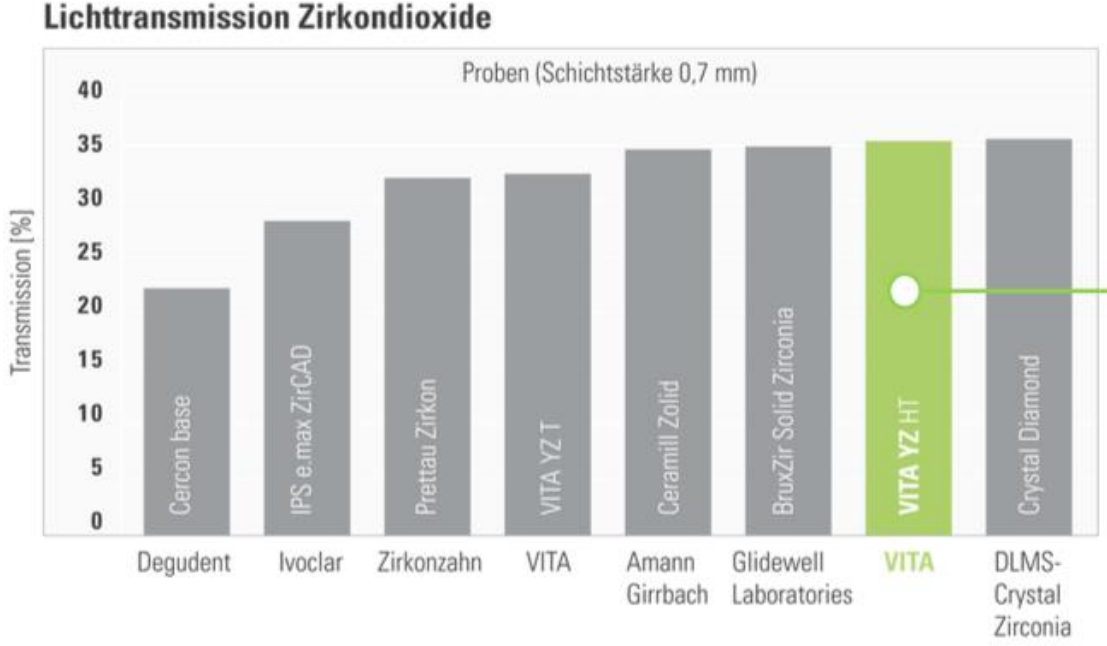


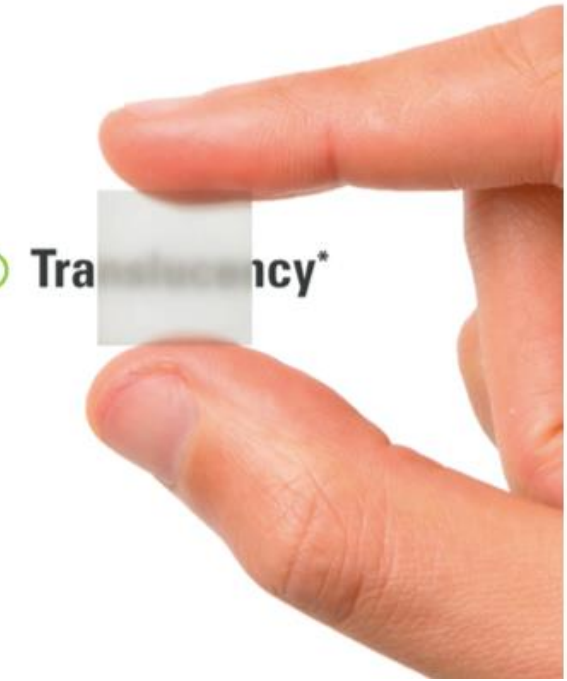


All Ceramic Materials – Zirconium Dioxide



All Ceramic Materials – Zirconium Dioxide





Quelle: Interne Untersuchung VITA F&E; Transmissionsmessung mittels Photo-Spektrometer; Proben: 0,7 mm Stärke, beidseitig hochglanzpoliert

All Ceramic Materials – Zirconium Dioxide

VITA YZ® SOLUTIONS

Indication

Material	Full contour anterior and posterior crowns	Full contour 3-unit anterior*/4-unit** bridges	Full contour multi-unit bridges with max. 2 pontics	Anterior and posterior copings	Multi-unit substructures with max. 2 pontics
VITA YZ T	☹	☹	☹	☺	☺
VITA YZ HT	😐	😐	☺	☺	☺
VITA YZ ST	☺	☺**	☺	☹	☹
VITA YZ XT	☺	☺*	☹	☹	☹

VITA YZ® SOLUTIONS

Physical/mechanical properties

Property	Unit	VITA YZ T	VITA YZ HT	VITA YZ ST	VITA YZ XT
Tosoh-Bezeichnung	-	TZ-3YSB-C	Zpex	Zpex 4	Zpex Smile
Y_2O_3	wt% mol%	5,2 3,0	5,2 3,0	7,3 4,0	9,3 5,0
CTE (20-500°C)	$10^{-6} \cdot K^{-1}$	ca. 10,5	ca. 10,5	ca. 10,2	ca. 10,0
3-Point-bending strength	MPa	ca. 1200	ca. 1100	ca. 870	ca. 600
Transluceny (1mm)	%	35	40	45	49

All Ceramic Materials – Zirconium Dioxide

Indication

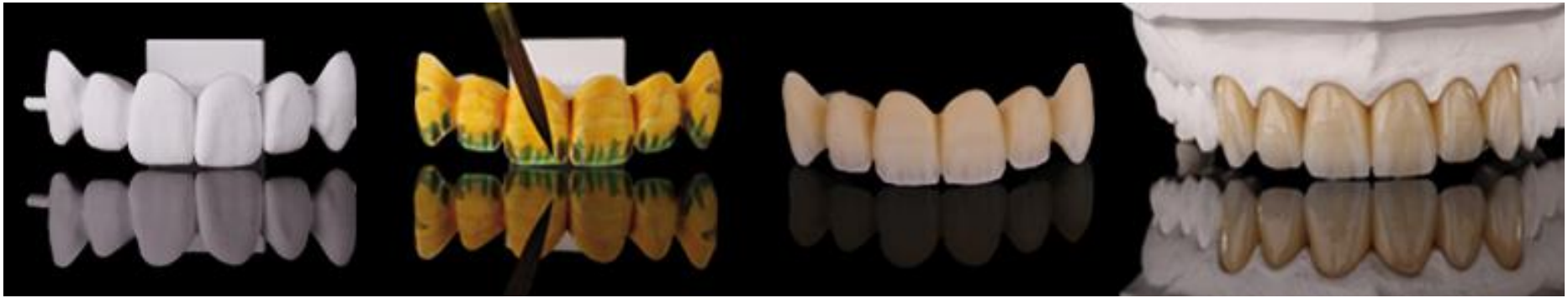
- Anteriour Crowns
- Posteriour Crowns
- Anteriour Bridges
- Posteriour Bridges
- Maryland Bridges
- Cantilever Bridges
- Abutments



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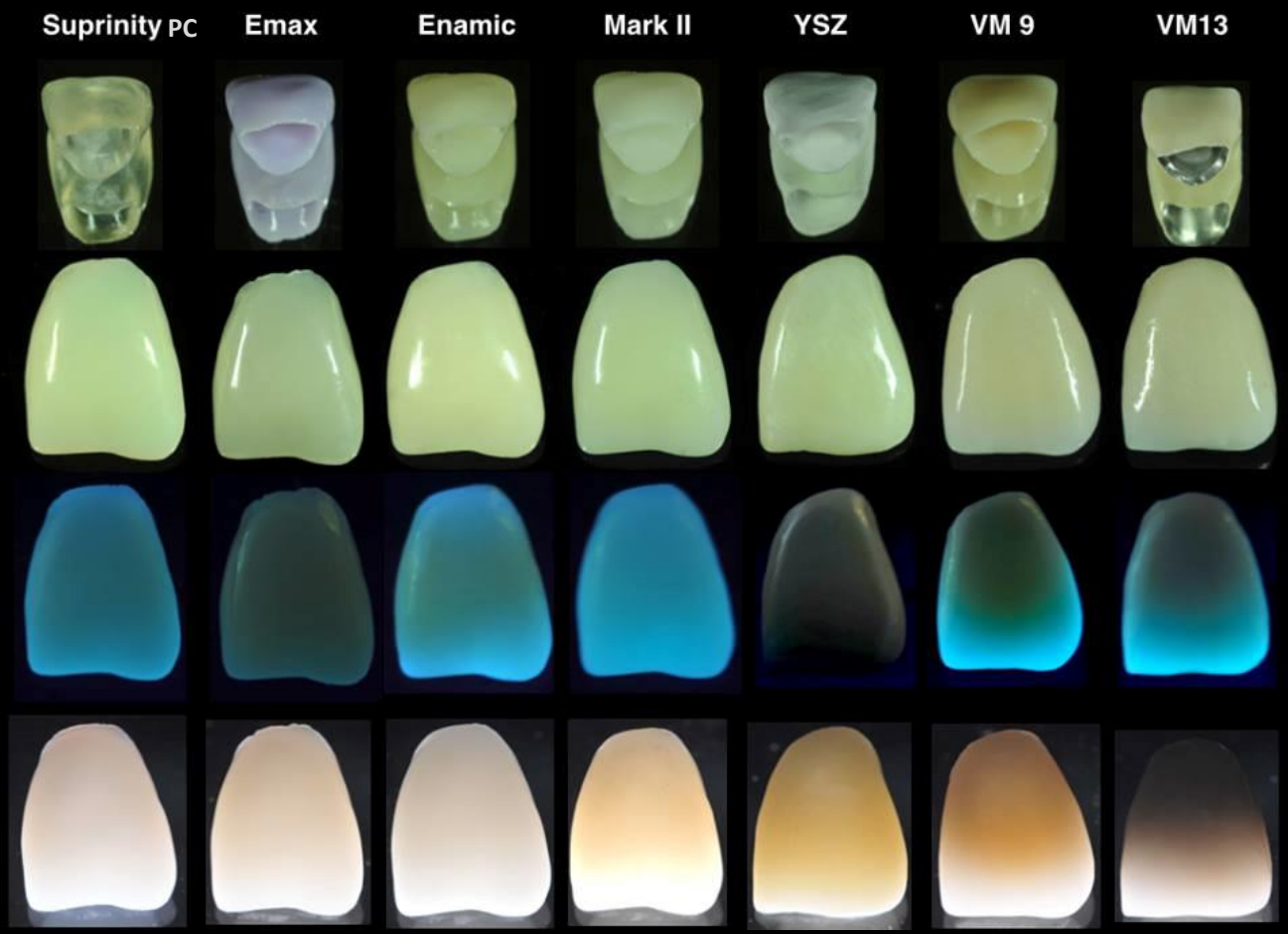
VITA

All Ceramic Materials – Zirconium Dioxide



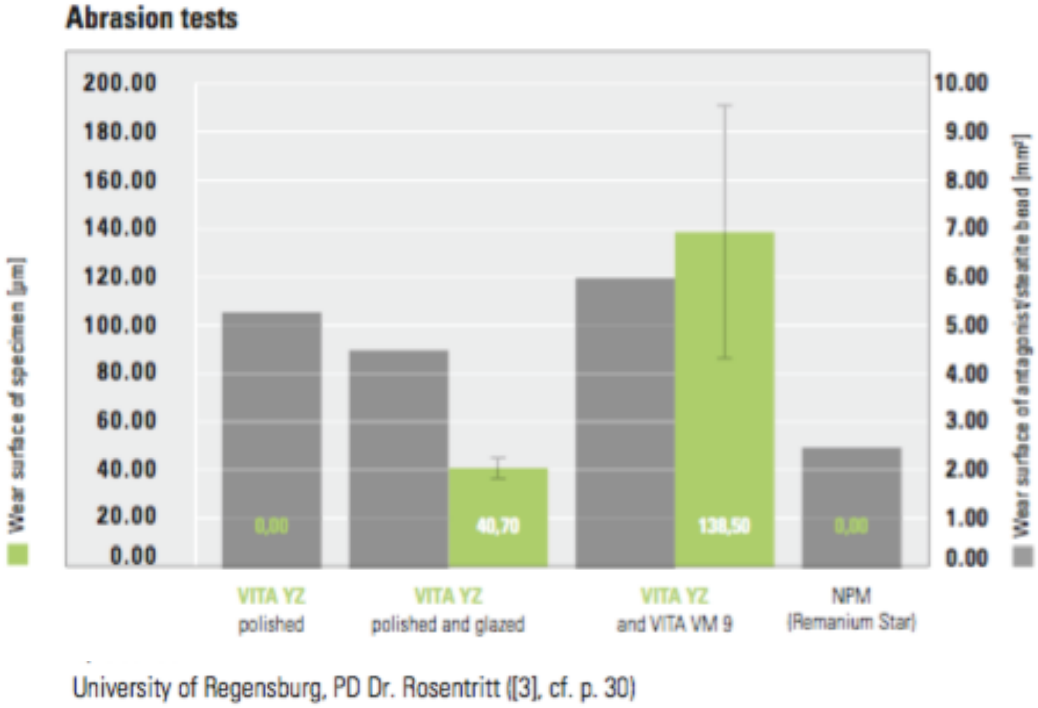


VITA



ZTM Vanik Kaufmann-Jinoian, Switserland

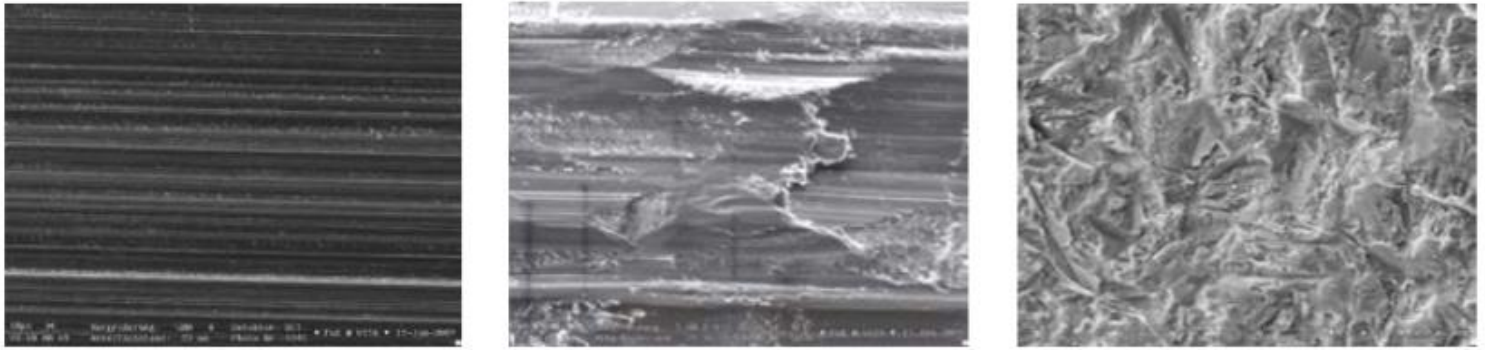
All Ceramic Materials – Zirconium Dioxide



University of Regensburg, PD Dr. Rosentritt ([3], cf. p. 30)

All Ceramic Materials – Zirconium Dioxide

Influence of systems of grinding tools for ceramics

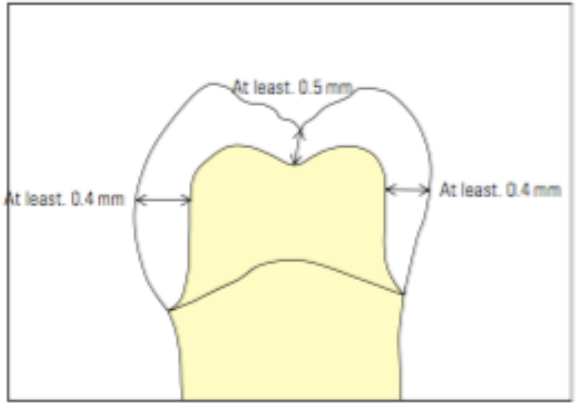


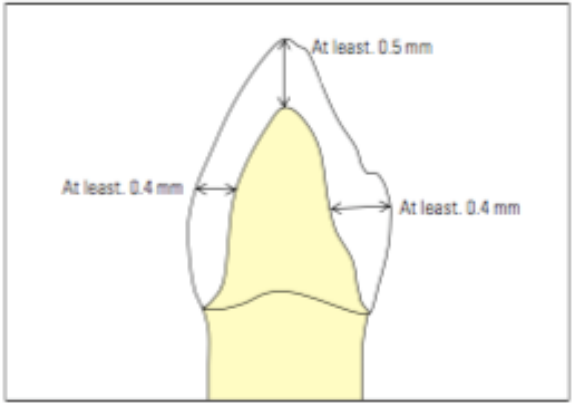
Figures 17 – 19: VITA YZ surfaces polished, adjusted with grinding/milling tools and sandblasted (from left to right), magnification 5,000x in each case

Einfluss Keramikschleifersysteme, Quintessenz Zahntechnik 2009 ([6], cf. p. 30)

All Ceramic Materials – Zirconium Dioxide

Preparation and ceramic layer thickness





Bridge Connections



VITA Zahnfabrik, YZ T / VITA YZ HT Working Instructions, Issue 07.2015

All Ceramic Materials – Zirconium Dioxide

Full-adhesive resin cement

- Adiva F – Vita Zahnfabrik
- Panavia V5 – Kuraray
- Panavia F2.0 – Kuraray
- Relyx Ultimate – 3M Espe
- G.Sem Linkforce – GC
- Variolink Esthetic – Ivoclar
- Multilink Automix – Ivoclar
- Nexus 3 (3th Gen.) – Kerr



Self-adhesive resin cement

- Adiva S – Vita Zahnfabrik
- Panavia SA Cement Plus – Kuraray
- Relyx Unicem 2 – 3M Espe
- G.Sem Linkace – GC
- Speedcem Plus – Ivoclar
- Maxcem Elite – Kerr
- Bifix SE – Voco
- Solocem – Coltene



Resin-modified glass ionomer cement

- Nexus RGMI – Kerr
- Vivaglass Cem – Ivoclar
- Luting Plus Relyx – 3M Espe
- Fuji Plus – GC
- Fuju Cem2 – GC
- Meron Plus AC – Voco
- Paracore – Coltene



All Ceramic Materials – Zirconium Dioxide

Crown: Non-Retentive preparation (Full-Adhesive)

- The restoration is pretreated
  - Sandblasted with Al-Oxide 50µ with 2bars of pressure
  - Conditioned (60sec) with a zirkonia-primer
- The preparation is isolated and cleaned
  - Polishing brush and cleaning paste free of oil and fluoride
- (Option) Apply phosphoric acid gel onto the enamel (for 15 -30sec)
- Rinse with water min. 5sec and dry with compressed air
  - Enamel surfaces appear chalky white
- Apply Self-etching adhesive the tooth surface, wait for min. 20sec
- Disperse the adhesive with oil- and moisture-free compressed air
  - a glossy, immobile film layer results
- (Option) Light-cure the adhesive for 10sec (Min. 500 mW/cm^2)
- Fill the restoration with adhesive composite cement
  - Light-cure 2sec / quarter with max. distance of 10mm
- Remove excess luting material and cover the margins with glycerine gel
  - Light-cure 20sec/quarter (Min. 1100 mW/cm^2)
- Wait for 5min. biting on a cotton roll.

Crown: Retentive preparation (Self Adhesive)

- The restoration is pretreated
  - Sandblasted with Al-Oxide 50µ with 2bars of pressure
  - Conditioned (60sec) with a zirkonia-primer
- The preparation is isolated and cleaned
  - Polishing brush and cleaning paste free of oil and fluoride
- Fill the restoration with adhesive composite cement
  - Light-cure 2sec / quarter with max. distance of 10mm
- Remove excess luting material and cover the margins with glycerine gel
  - Light-cure 20sec/quarter (Min. 1100 mW/cm^2)
- Wait for 5min. biting on a cotton roll.



All Ceramic Materials – Zirconium Dioxide

Advantages

- High Flexural Strength
- Different Translucensies
- Minimally invasive Preparation
- Multiple Indication
- Easy Cementation
- >10 years experience

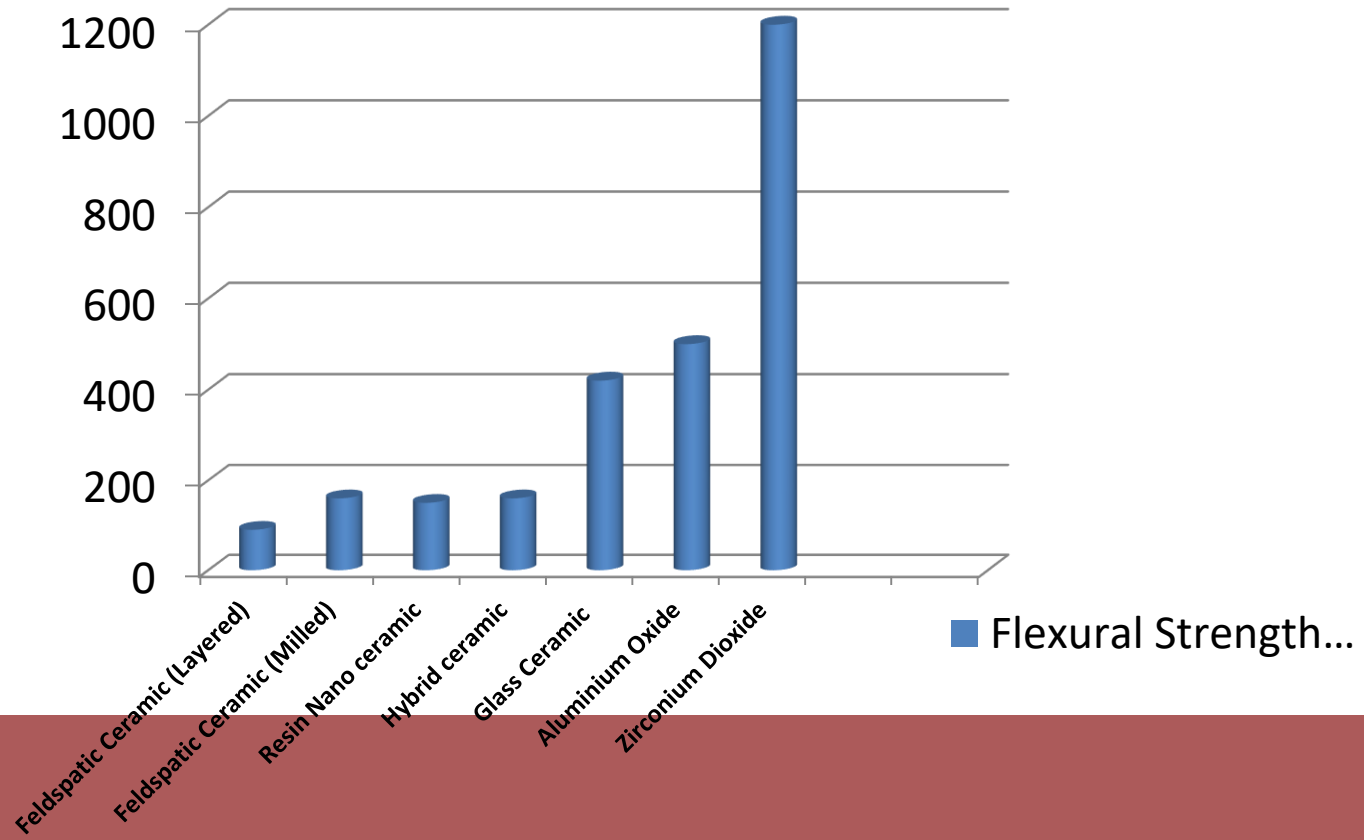
Disadvantages

- No Force Absorbation
- No Fluorescence / Opalescence
- Limited Aesthetics
- No Materialwear
- Less ideal as implantrestoration

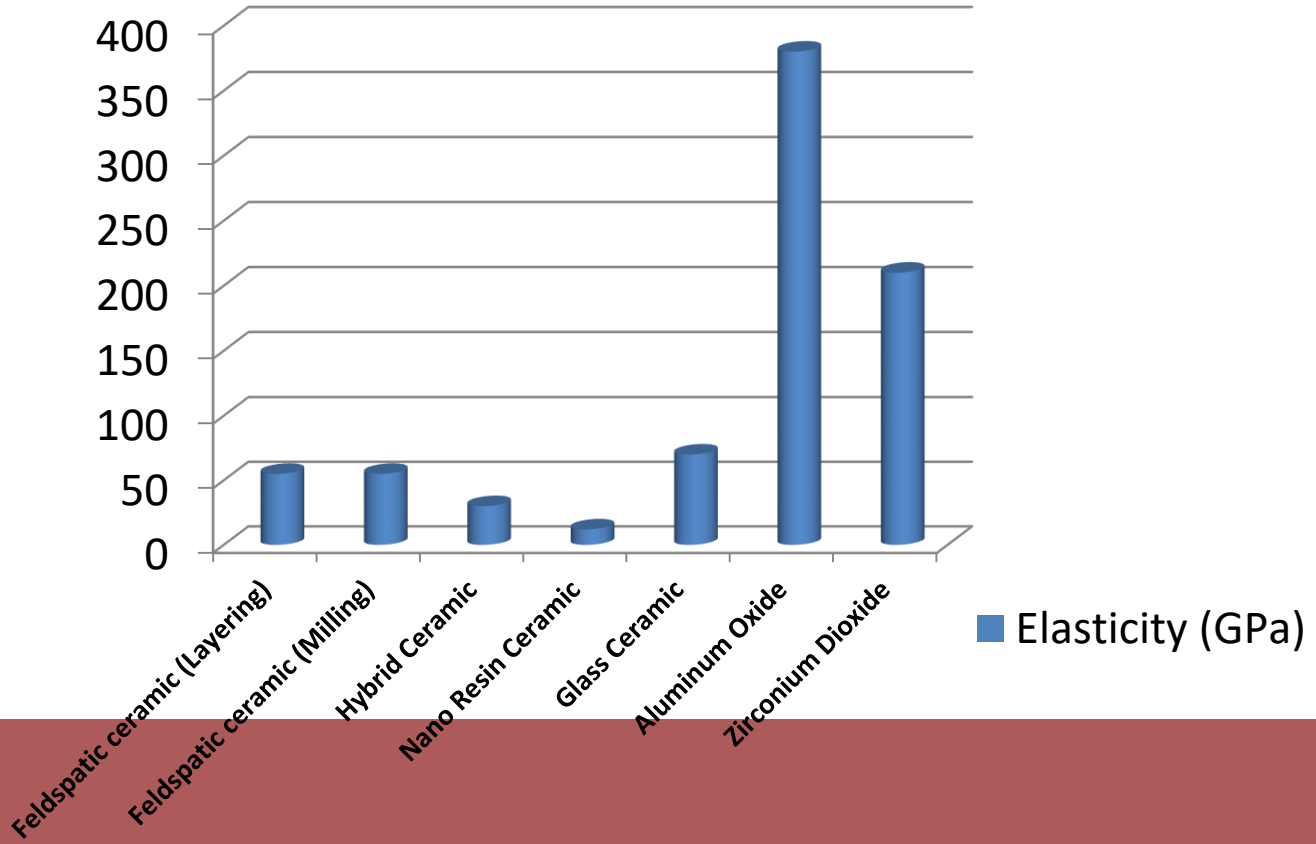


Recommondation: **Ideal for posterior single crowns & bridgework**

All Ceramic Materials – The complete overview

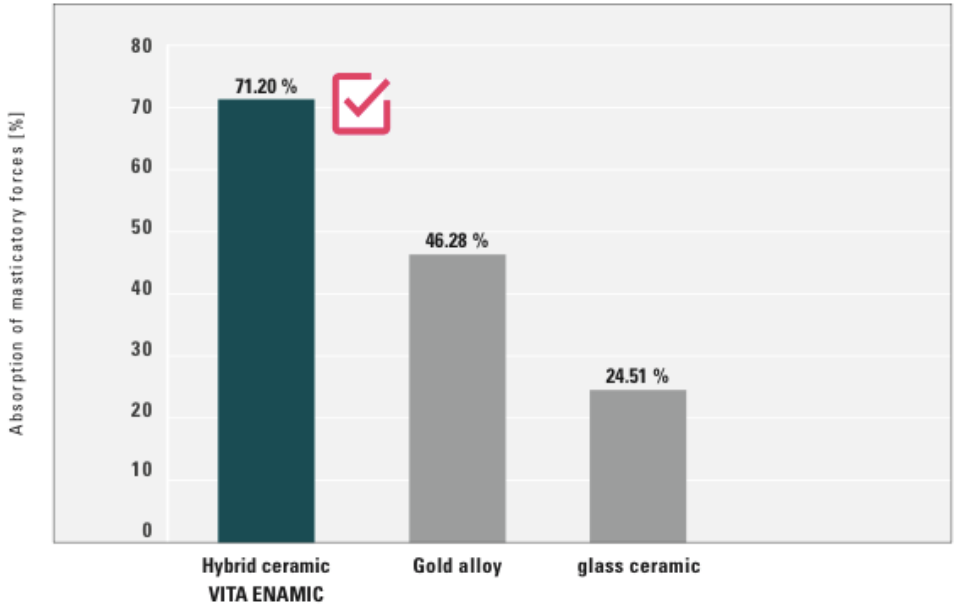


VITA All Ceramic Materials – The complete overview

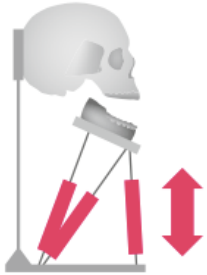


VITA All Ceramic Materials – The complete overview

Absorption of masticatory forces compared to zirconia (ZrO_2)

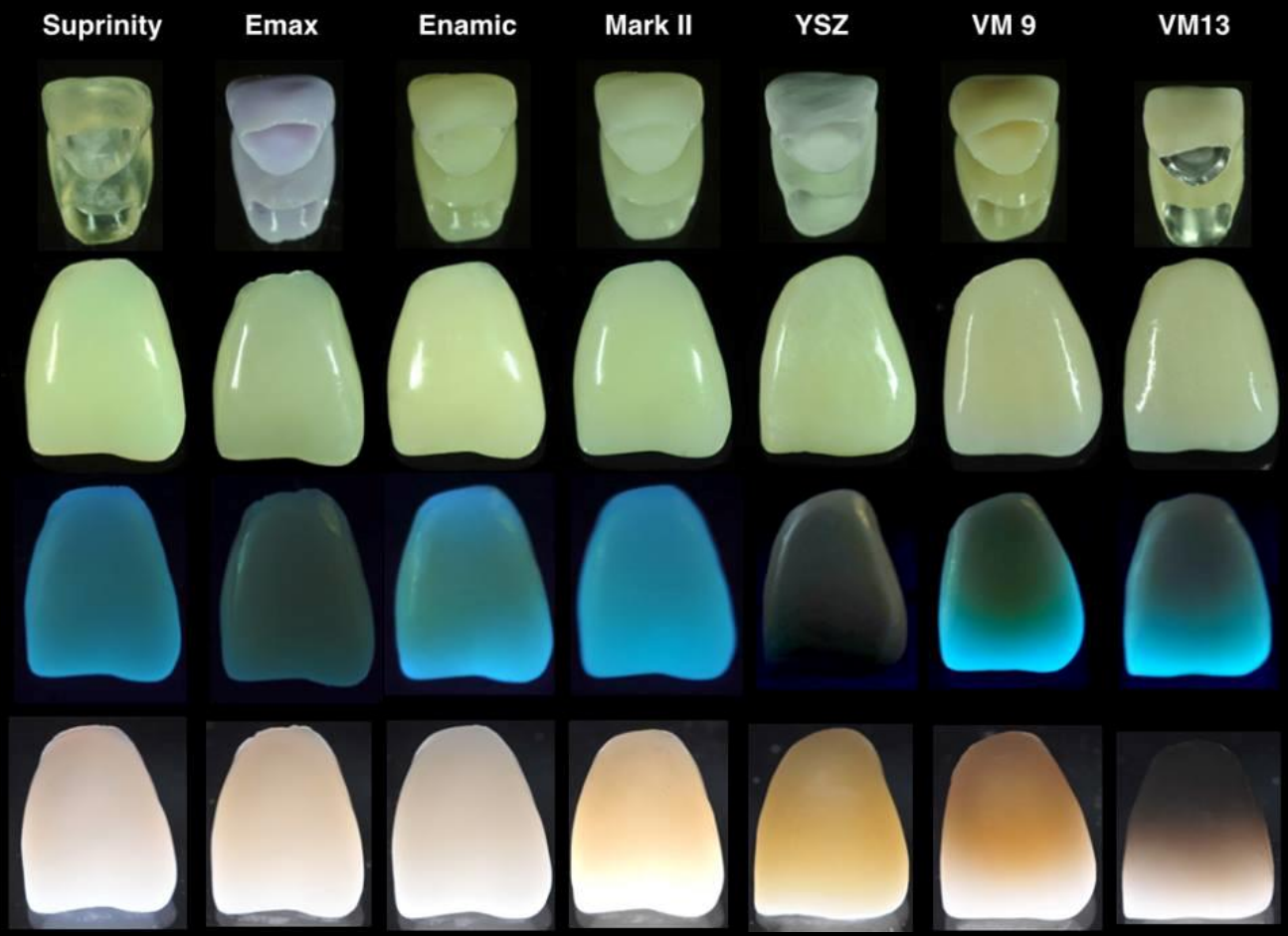


Material class	Modulus of elasticity [GPa]	Force transmission (N)	Absorption of forces (%) compared to ZrO_2
Zirconia	210 GPa	641.8 N (SD 6.8)	
glass ceramic	96 GPa	484.5 N (SD 5.5)	-24.51 %
Gold alloy	77 GPa	344.8 N (SD 5.7)	-46.28 %
VITA ENAMIC hybrid ceramic	30 GPa	184.9 N (SD 3.9)	-71.20 %



Source: University of Genoa, Department for fixed and implant-prosthetic restorations, Dr. Maria Menini et al., Genoa, Italy ([8], cf. p. 35)

VITA



ZTM Vanik Kaufmann-Jinoian, Switserland

VITA All Ceramic Materials – The complete overview

Indication	
• Veneers	Glass ceramic / Feldspar Ceramic
• Non-Prep Veneers	Hybrid Ceramic / Feldspar Ceramic
• Inlays	Hybrid ceramic / Feldspar Ceramic
• Onlays	Hybrid ceramic / Feldspar Ceramic
• Anteriour Crowns	Glass ceramic / Feldspar Ceramic
• Posteriour Crowns	Hybrid Ceramic / Glass ceramic / Zirconium Dioxide
• Implant Crowns Anterior	Glass ceramic
• Implant Crowns Posterior	Hybrid Ceramic
• Fuctional Disorder	Hybrid Ceramic
• Small Anterior Bridges	Zirconium Dioxide
• Small Posterior Bridges	Zirconium Dioxide
• Maryland Bridges	Glass ceramic
• Big Bridges	Zirconium Dioxide / Metal Ceramic
• Cantilever Bridges	Zirconium Dioxide / Metal Ceramic

All Ceramic Materials – The complete overview



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