

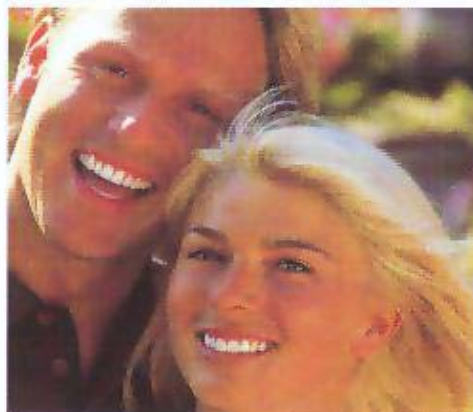
Problem Solving in Dentistry:

NEW MATERIALS AND TECHNIQUES IN PROSTHODONTICS

*Asbjørn Jokstad
Institute of Clinical Dentistry, University of Oslo, Norway*



Realistic white shades for special cosmetic needs



SYNERGY® Super White shades are ideal for restoring whitened teeth and deciduous teeth.

Only SYNERGY® offers three different bright white shades – selected by dentists.

- Super White N (neutral)
- Super White O (opaque)
- Super White P (pearl)



...e shades, tooth
...hed with one-
...uced veneers

Let SYNERGY® Super White assist you with your cosmetic needs.



Before veneer



After SYNERGY® Super White veneer

...and new patients?



Style "M"



Tooth



Tooth + Mucosa

Fixed ← →

← → Removable

Implant

Mucosa



New materials & methods—Fixed prosthetics

1. Rotating instrument

2. Root Post

3. Gingival retraction

4. Impression/ -tray

5. Bite & jaw registration

6. Color shade

7. Temporary construction

8. Restorative materials

9. Production techniques

10. Cementation

New materials & methods – other topics

- Repairs (Ceramic fracture, crown removal, post retrieval, etc.)
- Dental implants
- Articulators
- Attachments
- Dentures: production, materials, lining & repairs
- Laboratories: production, materials⁵

New materials & methods—Fixed prosthetics

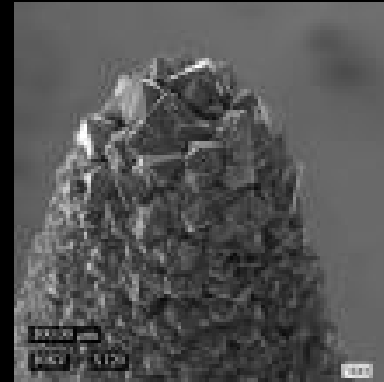
Preparation and Finishing Kits

Axis

- Acrylic Adjustment Kit
- R.A.P.T.O.R. Resin Sculpting Set
- R.A.P.T.O.R.

Brasseler

- Acrylic Temporization Kit
- Anterior Bur Box
- Esthetic Inlay/Onlay
- Nixon Inlay/Onlay II
- Nixon Porcelain Veneer II Laminate Veneer System
- Ultra Denture Adjustment & Polishing Kit



Cosmedent

Top Finisher System

Dentsply/Caulk

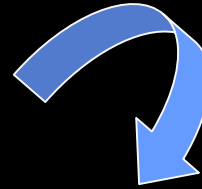
Enhance Composite Finishing and Polishing System

Nobel Biocare

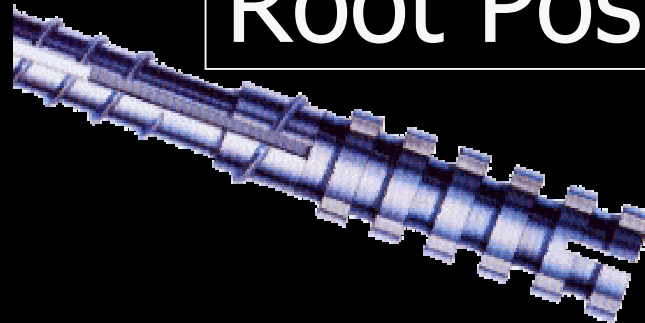
Procera Preparation Kit

New materials & methods—Fixed prosthetics

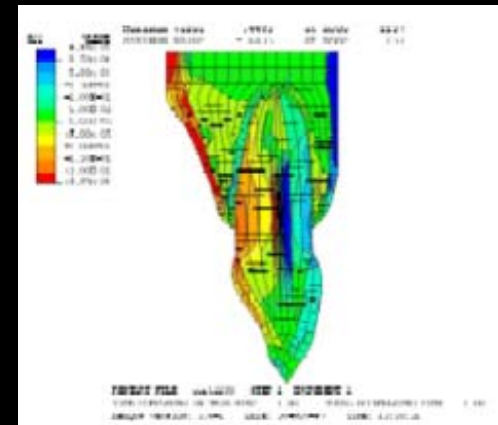
Rotating instrument



Root Post



1. Cast
2. Prefabricated
 1. Metal
 2. Non-metal



Cast Posts

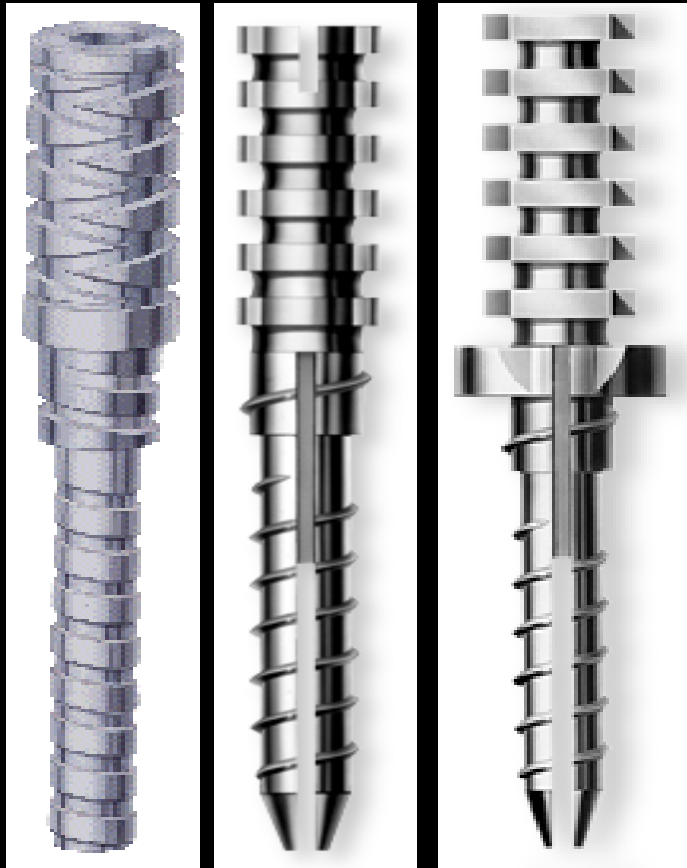
1. Indirect

- Impression

2. Direct: Post & resin

- Wax
- Resin
 - Accuset
 - ExactaCast
 - Luminex
 - GC Pattern Resin

Prefabricated Posts in metal



Steel
Titanium-alloy
Titanium

"Active" – "Inactive"

Conical
Parallel
Steps

Threaded
Smooth
Structured

Slots & grooves

Flat
Conical
Ovoid

Posts & Core

1. Cast Posts

1. Indirect
2. Direct: Post & resin

2. Prefabricated Posts

	Additional Core	
Metal	No	Yes
Non-metal	-	Yes
	> 30 products	

"Core"-materials

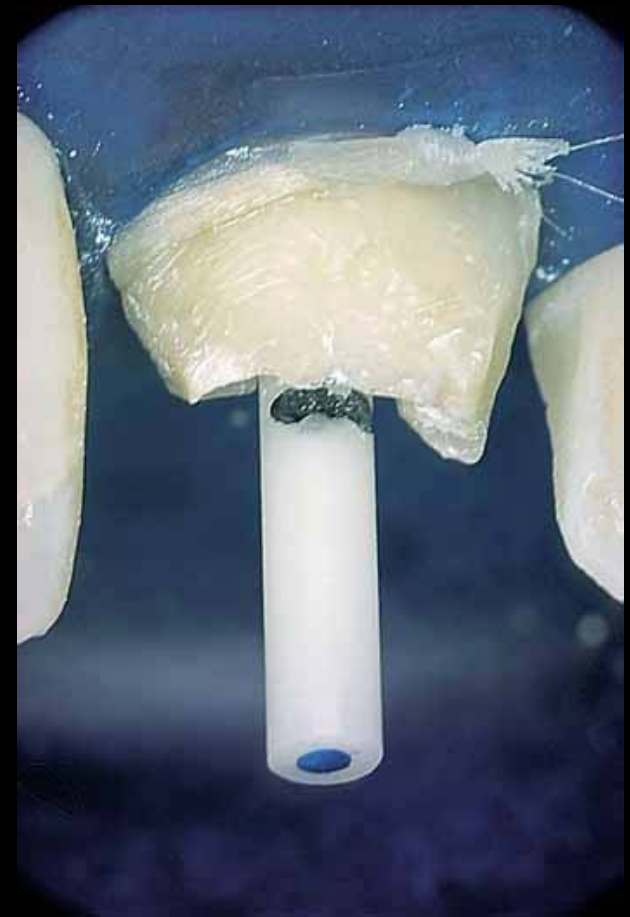
Bis-core	Bisco	Dual co.	CuRay-support	Sci-Pharm	Dual co.
Bisfil core	Bisco	Light co.	Encore	Centrix	Chem.Co
Bisfil II	Bisco	Chem.Co	FluoroCore	Dentsply	Dual co.
Blue core	Teledyne	Chem.Co	Fuji-II LC	GC	GIC-modif.
Build-It! FR	Jeneric	Dual co.	HardCore	Pulpdent	Dual co.
Ceracap	Brasseler	ceramic	Infracore	Temrex	Dual co.
Clearfil Core	Kuraray	Chem.Co	Ketac silver	3M ESPE	Ag-GIC
" " PhotoCore	Kuraray	Light co.	Light-Core	Bisco	Light co.
Coradent	Vivadent	Chem.Co	LuxaCore Auto	DMG	Dual co.
Core Paste	Den-Mat	Chem.Co	MagnaCore	Bosworth	Dual co.
" " Syringe	Den-Mat	Dual co.	Microrest Core	GC	Chem.Co
Core-Flo	Bisco	Chem.Co	Parapost Paracare	Coltene	Dual co.
CoreRestore2	sds/Kerr	Dual co.	Rebilda	VOCO	Chem.Co
" " HDOC	sds/Kerr	Light co.	Ti-Core	EDS	Chem.Co
CoreShade	Shofu	GIC	Vitremer	3M Espe	GIC-modif.

Prefabricated Non-metallic Posts

Five main groups

Ceramic

1. Prefabricated
2. Made in the dental technician laboratory



Posts made in ceramics

Prefabricated

Biopost (Incermed), ZrOx, D, ~ 1990

Cerapost (Brasseler), 1995

Cosmopost (Ivoclar), 1998

Laboratory

+ "Cosmopuck" (Ivoclar), 1998

In-Ceram (VITA), 1994

Prefabricated Non-metallic Posts

Five main groups

1. Ceramic, Prefabricated
2. Ceramic, made in laboratory
3. "Black Post", Carbonfibres dispersed in resin
4. "White Post", Quartsfibres dispersed in resin
5. "Translucent Post"

Non-metal, non-ceramic Posts

Carbonfibre (1990) Quartsfibre (1997)

Most producers make both "Black" and "White"
Posts, i.e. The resin-part identical

Epoxi, BIS-GMA or other proprietary resins

Big variations with regard to product quality,
batch-homogeneity, production method, etc

Different physical-mechanical properties, clinical
relevance unknown

Can be removed if revision of endodontic

Non-ceramic Posts - many variants

Quartz

Quartz+Zirkonium

(Carbon)

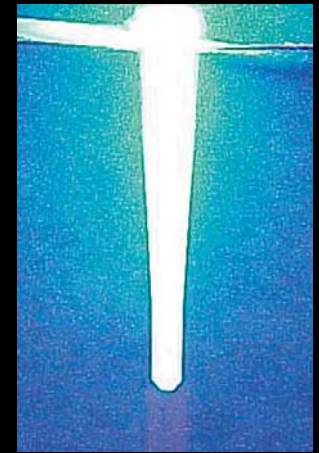
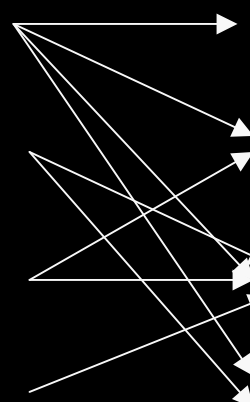
Quartz & Carbon

composite

"resin"

epoxi

polyester



Carbonfibre dispersed in resin ("Black Post")

1. Composipost (RTD)
2. Absolu (SPA)
3. Carbonite (H Nordin)
4. Carbopost (Carbotech)
5. C-post (Bisco) (Composipost licenced in USA/Canada)
6. Dental Perfect System (Dental Emco)
7. Miratfite Carbon (Hager) (Carbonite - other name)
8. Top Dent CarbonfiberPost

Quartzfibre dispersed in resin("White Post")

1. FibreKor Post System (Jeneric/Pentron)
2. Glassix (Harald Nordin)
3. Parapost Fiber White (Coltene Whaledent)
4. Snowpost (Carbotech)
5. Top Dent QuartzfiberPosts
6. Æsthi Plus post (RTD) (promoted in some countries, e.g. Scandinavia as "White Composipost")

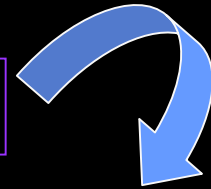
Translucent - (Quartz) fibre-reinforced , resinmatrix commonly polyester

1. Luscent (Dentatus),
2. Snowlight (Carbotech)
3. Endo-composipost, D.T –light post or U.M. end-light post, etc. (RTD)

New materials & methods—Fixed prosthetics

Rotating instrument

Root Post



Gingival retraction

1. Cord
 - Impregnated
 - Non-impregnated
2. Gel/paste
3. Cotton
4. Electrosurgery
5. (Copper-tube)



RetractionCord, Impregnated

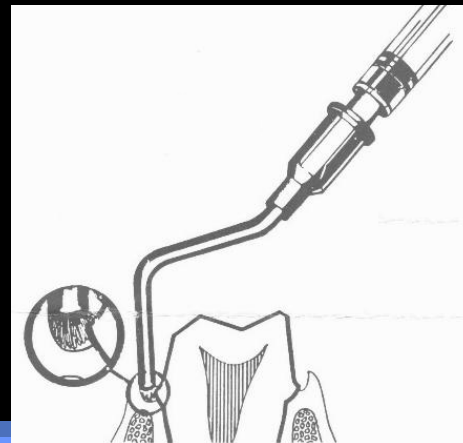
<u>Product</u>	<u>Producer</u>	<u>Active substance</u>	<u>Type</u>
Altrac	VOCO	AlCl_3	
Biopak	SDI	AlCl_3	twinned
Crown-Pak	Gingi-Pak	dl-Adrenalin (4-ply)	twinned
Gingi-Aid	Gingi-Pak	$\text{Fe}_2(\text{SO}_4)_3$	woven
Gingi-Pak	Gingi-Pak	dl-Adrenalin (2ply- Soft-twist)	twinned
Gingi-Tract	Den-Mat	AlSO_4 , 0.5 mg/i	twinned
Gingibraid	VanR	AlKSO_4 /adrenalin + Aluminium	braided
Hemalin	VOCO	Adrenalin	
Hemodent	HAWE Premier	AlCl_3 21%	twinned
Pascord	Pascal	AlSO_4	twinned
Racestyptin	Septodont	AlCl_3 +lignocain	braided
Racord	Pascal	dl-Adren HCl +Znfenolsulfonat 0.3%	twinned
Retracto	Roeko	AlCl_3	
Sil-Trax	Pascal	AlSO_4 /dl-adrHCl/dl-adr+Znfenolsulfonat	braided
Retreat/II	Henry Schein	AlSO_4 /adrenalin	twin/braid
Sulpak	Sultan	AlK N.F/adrenalin HCl 4%	twin/braid
Traco	VOCO	AlCl_3 6%	
Ultrax	Sultan	AlK N.F/adrenalinHCl 4% /AlK+adr	braided
Unibraid	VanR	Adrenalin-alum	braided
Z-twist	Gingi-Pak	dl-Adrenalin/ AlCl_3	woven ²¹



RetractionCord, Non-impregna



Astringedent (Ultradent), Astringedent X (Ultradent), First Stop (Stevenson), Gingi-Aid (Gingi-Pak), Gingiva liquid (Roeko), Hemodent (HAWE Premier), Hemo-gin-L (Van R Dent Prod.), Hemo-stat (Henry Schein), Ocu Clear (Health Care Prod), Orostat (Gingi-Pak), Rastringent (Pascal Comp), Racemistat (Pascal Comp), Stasis (Gingi-Pak), Styptin (Van R Dent. Prod), Ultradent Alum Chlor. (Ultradent), ViscoStat (Ultradent), Visine (Pfizer Inc), Wet Pack (Van R Dent. Prod.)



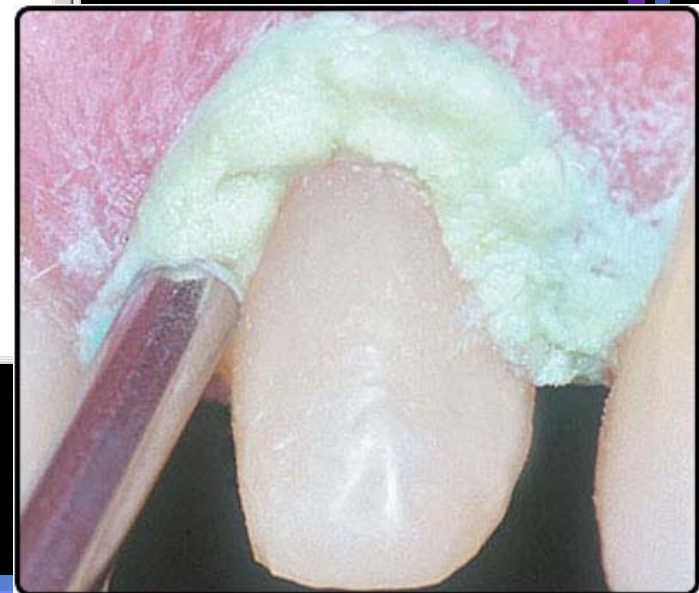
Expasyl (Kerr /Pierre Roland)



白水貿易株式会社

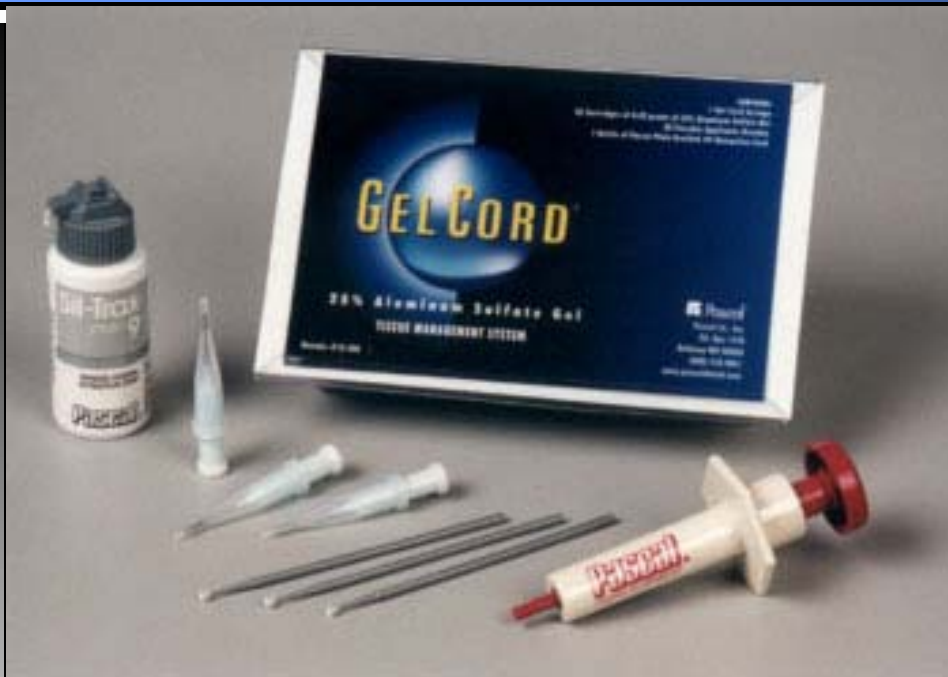
fGfLFXfpWf<□ifsfG□[f<□□[f%
f“fhZÐ□j

Expasyl™



15% Al-Chlorid + Caolin

Lebanon Dental Association, Beirut, 28th August 2003



Gel-Cord (Pascal)



Comprecap (Roeko)

Retrac



New materials & methods—Fixed prosthetics

Rotating instrument

Root Post

Gingival retraction

Impression/ -tray



How to do : The perfect impression?





Method 1- One polymerisation - one viscosity

SYN: One phase technique , Single phase impression,
Medium viscosity technique, Single mix technique,
Single mix single impression, Monophase technique

Materials – ex.

Aquasil Monophase

Examix Monophase

Imprint II

Impregum F

Provil Novo Monophase

President System 75

Dentsply

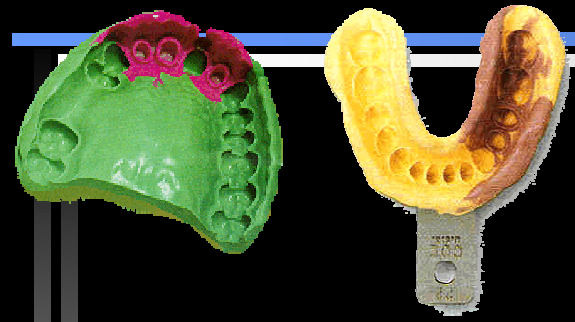
GC

3M Espe

3M Espe

Kulzer

Coltene



Method 2- One polymerisation - two viscosities

SYN: Double mix technique, Double mix single impression, Express technique, One step putty wash technique, Sandwich impression, Simultaneous one-step technique, Two phase technique/ impression, Wet/Wet impression

Materials – ex.

Aquasil Putty + Reprosil HF Light	Dentsply
Examix Putty + Examix Regular eller Inject	GC
Express Putty + Express Medium	3M Espe
Impregum F + Permadyne	3M Espe
Optosil Comfort P Plus + Xantopren	Kulzer
President Heavy + President (Jet) Light	Coltene



Method 3 – Two polymerisations -two viscosities

SYN: Correction impression, Double impression, Double mix double impression, Overlay impression, Putty-wash technique / impression, Two-step putty-wash technique, Wash technique, Wet/Dry impression

Materials – ex.

Coltoflax + Coltex Xtrafine

Coltene

Panasil Heavy + Panasil Regular

Kettenbach

President Putty Soft + President (Jet) Light

Coltene

Examix Putty + Examix Regular

GC

Express Putty + Express Medium

3M Espe



Aquasil Putty + Reprosil HF Light

Dentsply

Method 4 - Dual-arch

SYN: Dual-arch impression, Double-arch impression, Triple tray technique, Closed-bite impression, Double arch single mix impression, Double arch double mix impression

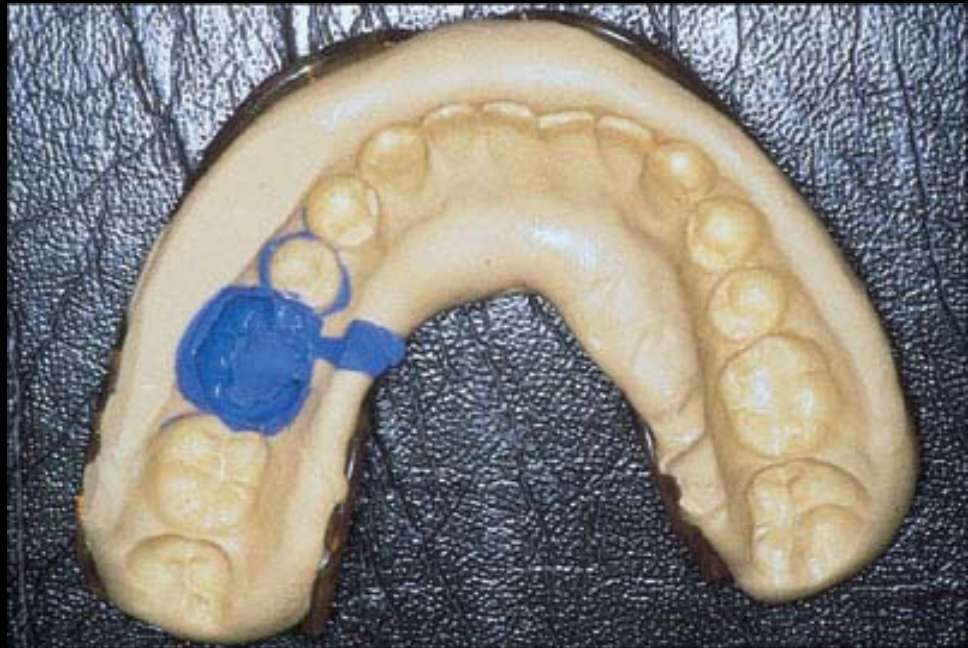


Dual-arch	Single-phase	Two-phase	Two-phase - two stage
<ul style="list-style-type: none"> • Patient comfort • Maximum intercuspoid • Easy for laboratory • Time 	<ul style="list-style-type: none"> • Fast 	<ul style="list-style-type: none"> • Hydraulic 	<ul style="list-style-type: none"> • Hydraulic 
<ul style="list-style-type: none"> • Occlusion? 		<ul style="list-style-type: none"> • Putty : wash hardness? 	<ul style="list-style-type: none"> • Teknique sensitive • Hydraulic

Method 5 - "Hydraulic"



Method 6 - "Laminar"



G Schoenrock (1989)

Method 7 – Tube-section

Excellent technique for
periodontally unstable
teeth



Impression Materials

Vinyl Polysiloxane

- 1a. **Aquasil**
Dentsply/Caulk
- 1b. **Honigum**
DMG/Zenith
- 1c. **Take 1**
sds/Kerr
- 2a. **Imprint II**
3M ESPE
- 2b. **Virtual**
Ivoclar Vivadent
- 3a. **Affinity**
Clinician's Choice
- 3b. **Splash!**
Discus
- 4a. **AFFINIS**
Coltene/Whaledent
- 4b. **Exafast NDS**
GC

Polyether

- 1. **Permadyne**
3M ESPE
- 2. **Impregum Penta Soft**
3M ESPE
- 3. **Impregum**
3M ESPE

Most used in USA

Percent used for impressions

	Crowns /bridges	Inlays /onlays
Vinyl siloxane	81%	71%
Alginate	38%	20%
Polyeter	28%	22%

Do you ever use individual tray?

Yes 73% No 24%

*Dental Products Report Survey, Nov 2000 n= 319 dentists₃₆

Problem nr.1 – Unstable tray

1. Metal

1. Full arch
2. Dual-arch

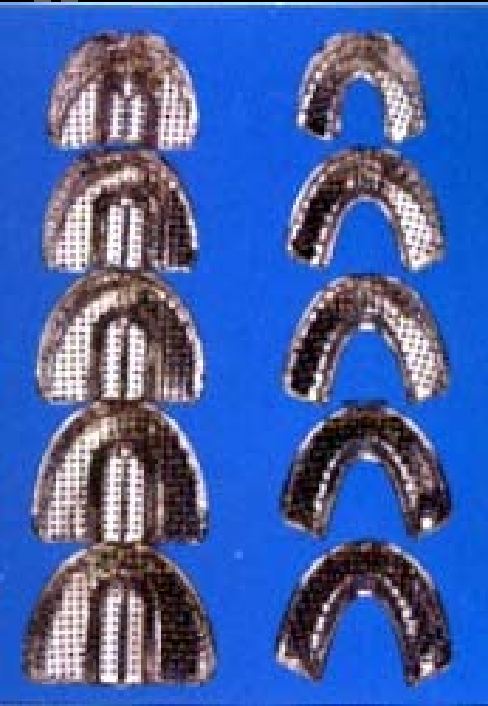
2. Plastic

1. Full arch
2. Dual-arch

3. Individual



Trays - metal



Platinated brass
Steel
Titanium
Aluminium

Perforated
Uperforated



Trays – dentulous

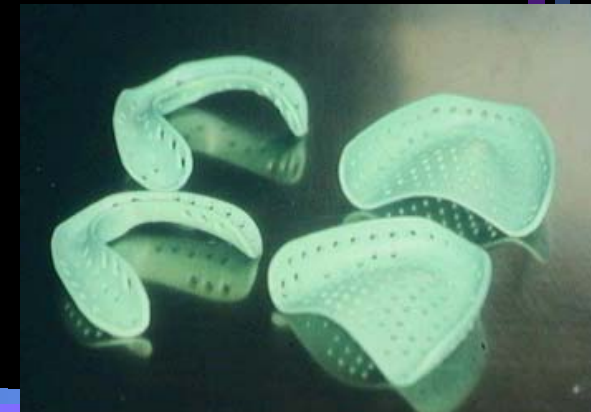
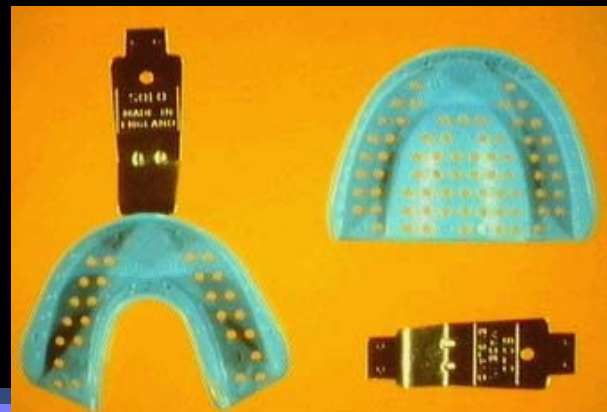


Trays – Dual-arch

- Bite Relator (Temrex)
- Bite Tray (Kerr)
- Exacta
- First Bite
- Quad-Tray
- Tri-Bite (Tri-Bite)
- Triple Tray (Premier)



Trays - plastic



Tray - individual

Candulor C-plast	Candulor Dental	Chemical
Cavex Shellac	Cavex	Heat
Citotray	Bayer AG	Light
Comtray	Schütz Dental	Light
Easy Tray	Kerr	Heat
Erkolen	Erkodent	Heat/Vacuum
Extoral	Pro-Den	Light
Fastray	H Bosworth	Chemical
Formatray	Kerr	Chemical
Hygon	Premier	Chemical
Individo/Lux	VOCO	Chemical/Light
Ostron 100	G-C Dental	Chemical
Palatray/LC	Hereaus Kulzer	Chemical/Light
Pekatray	Bayer	Chemical
Spectra-Tray	Ivoclar	Light
SR-Ivolen	Ivoclar	Chemical
T-LUX	Scheu Dental	Light
TrayAcryl	Schütz Dental	Chemical
Triad	Dentsply	Light



Trays – metal implant

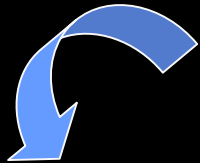


New materials & methods—Fixed prosthetics

Rotating instrument

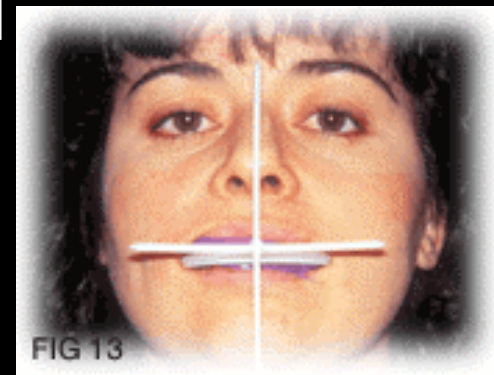
Root Post

Gingival retraction

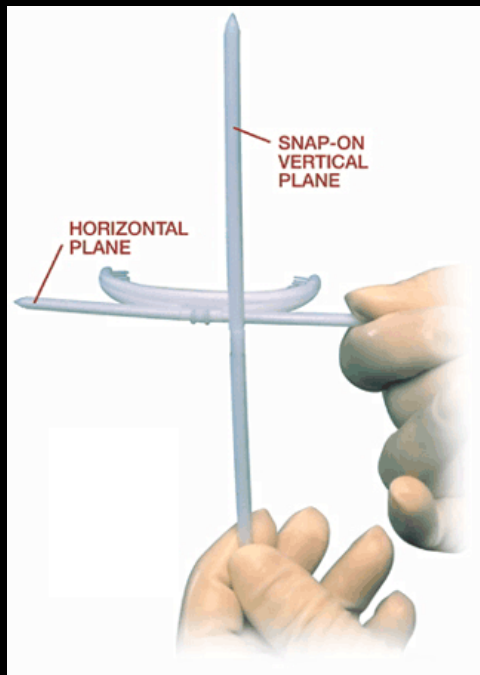


Impression/ -tray

Bite & jaw registration



Bite & jaw registration



Symmetry Facial Plane Relator

The screenshot shows the Jaws 3.0 software interface. The title bar reads "Jaws 3.0 Serial number: 3333". The menu bar includes "Data", "System configuration", "Information", and "Exit". The main menu includes "Patient", "Adjust", "Hinge axis", "Registration", "Position analysis", "Occlusal distance", and "Articulator".

The interface is divided into several sections:

- Section:** Technician page
- Print:** Print button
- Calculate:** Joints (checked), Front table (unchecked)
- Show:** Image (checked), Grid (checked), Radius (checked)
- SAGITTAL RIGHT:** Graph showing a curve on a grid.
- SAGITTAL LEFT:** Graph showing a curve on a grid.
- Articulator:** 3D model of the articulator.
- Section 1 ... 247 of 264:** Stuart
- Condylar insert (Right):** 36° Inclination, 1/2° Curvature, TP-selection, TB-Record, Radius 14 mm.
- Condylar insert (Left):** 31° Inclination, 3/4° Curvature, TP-selection, TB-Record, Radius 20 mm.
- HOR RIGHT / HOR LEFT:** Graphs showing horizontal curves.
- Grid:** Gitterraster 1 mm
- Status Bar:** 000000 DEMO, Record 1 / 7, Protusion, Teeth contact, Unguided, Zur Artikulatorprogrammierung (Kondylarbahneigung, Frontzahnuehrung), 13-09-93

Bite Registration Materials

1a. Exabite II NDS
GC

1b. Jet Bite
Coltene/Whaledent

1c. Peppermint Snap
Discus

2a. Blu-Mousse
Parkell

2b. Vanilla
Discus

3a. Milk Chocolate
Discus

3b. Regisil Rigid
Dentsply/Caulk

3c. Take 1 Bite
sds/Kerr

4a. LuxaBite
DMG/Zenith

4b. Virtual Bite
Ivoclar Vivadent

5. Affinity Quick Bite
Clinician's Choice

New materials & methods—Fixed prosthetics

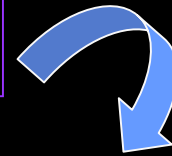
Rotating instrument

Root Post

Gingival retraction

Impression/ -tray

Bite & jaw registration



Color shade

Separate lecture
about color



New materials & methods—Fixed prosthetics

Rotating instrument

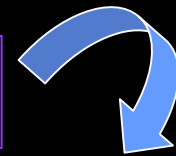
Root Post

Gingival retraction

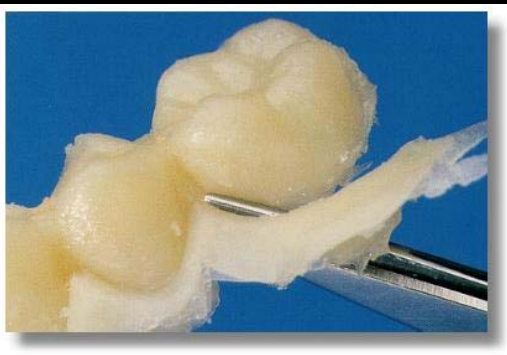
Impression/ -tray

Bite & jaw registration

Color shade



Temporary construction



Alternatives

- Bis-Acrylic composite
- Polymethyl metacrylate
- Polyethyl methacrylate

- Microfill light cured
- UDMA composite

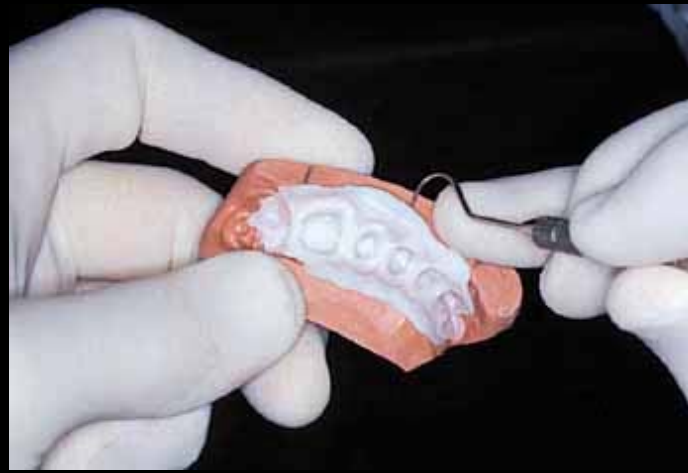
Bis-acryl most popular

*What type(s) of materials do you use to fabricate temporary restorations in your office?**

Self-cure bis-acryl resin	63%
Stock polycarbonate crowns	40%
PMMA/acrylic	34%
PEMA	21%
Microfill	16%
Ethyl vinyl methacrylate	8%
Light-cured composite	8%
Urethane dimethacrylate	5%
Thermoplastic	2%
Other	10%

*Multiple responses accepted.

Source: December 2002 DPR
Temporary Restorations Survey





Chemical cured

Cool Temp

Integrity

Luxatemp Automix

Protemp 3 Garant

Structur 2

Tempofit

Trim II H

Coltene

Dentsply

DMG

3M ESPE

VOCO GmbH

Detax

Bosworth



Dual cured

Chemical to elastic stage,
final light polymer

- Iso-Temp
 - Resin
- Provipont DC
 - Isocyanate-polyol /dimetacrylate
- Unifast LC
 - methyl metacrylate



Temporary cements

- Eugenol -containing
 - E.g. Temp-Bond og IRM
- Non-eugenol-containing
 - E.g. Nogenol og Dycal
- Light & chemical cured
 - E.g. Provilink

Zinc oxides top for cements

*What types of materials do you use for cementation of temporary restorations?**

Zinc oxide eugenol	60%
Zinc oxide non-eugenol	50%
Resin	23%
Polycarboxylate	23%
Other	14%

*Multiple responses accepted

Source: December 2002 DPR
Temporary Restorations Survey

Temporary cements

- CaOH
 - Provicol
 - Reocap Temp IC
- VOCO
- Vivadent

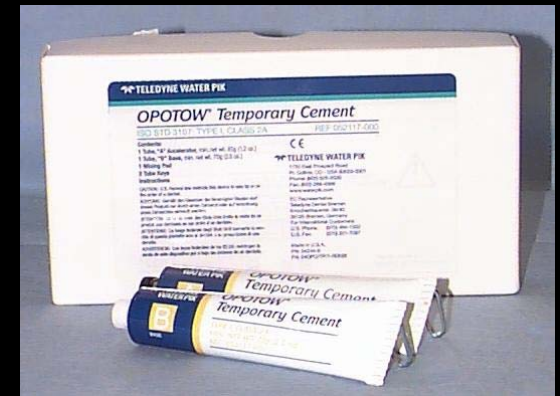
Temporary cements

- CaOH
- Zn-Ox non- eugenol
 - Freegenol GC
 - Rely-X Temp NE (3M ESPE)
 - Temp-Bond NE sds/Kerr



Temporary cements

- CaOH
- Zn-Ox
- Zn-Ox-Eug
 - Opotow Temporary (Teledyne)
 - Opotow Trial (Teledyne)
 - Rely-X Temp E (3M ESPE)
 - Temp-Bond (sds/Kerr)



Temporary cements

- CaOH
- Zn-Ox
- Zn-Ox-Eug
- Zn-Ox-Eug ++
 - Nobetec Nordenta



Temporary cements

- CaOH
- Zn-Ox
- Zn-Ox-Eug
- Zn-Ox-Eug ++
- Other
 - Durelon (3M ESPE)
 - Provilink (Vivadent)



Temporary cements

- ...
- Cavex In-Between Cavex
- Ginvatect nF Detax
- Hy-Bond Temp. Cement Shofu
- Nogenol Coe Laboratories
- Neo-Temp Teledyne
- ProviCem DMG
- SternOmega Temp.Cem Sterngold
- TempoCem DMG
- Temporan Detax
- Temrex TNE Temrex
- Until Sci-Pharm Inc.
- Zoe B&T Caulk Dentsply
- ...

New materials & methods—Fixed prosthetics

Rotating instrument

Root Post

Gingival retraction

Impression/ -tray

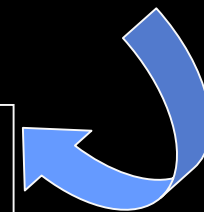
Bite & jaw registration

Color shade

Temporary construction



Restorative materials



Ceramics

All-Purpose

- 1a. **Ceramco 3**
Dentsply/Ceramco
- 1b. **Omega 900**
Vident
- 2. **Ceramco II**
Dentsply/Ceramco
- 3a. **Creation**
Jensen
- 3b. **IPS d.Sign**
Ivoclar Vivadent

Bonded

- 1. **IPS Empress**
Ivoclar Vivadent
- 2. **IPS Eris**
Ivoclar Vivadent
- 3. **OPC**
Pentron
- 4. **Finesse All-Ceramic**
Dentsply/Ceramco

Miscellaneous

- 1a. **Duceram LFC**
Dentsply/Ceramco
- 1b. **Procera AllCeram**
Nobel Biocare
- 2. **Finesse**
Dentsply/Ceramco
- 3a. **In-Ceram Alumina**
Vident
- 3b. **In-Ceram Spinell**
Vident

Most used in USA – full ceramics

1. Pressed 63%

(e.g., Empress, OPC)

2. Aluminium-oxide 46%

(e.g., Procera)

3. Lithium disilicate 36%

(e.g., Empress 2)

*Dental Products Report Survey, Nov 2000 n= 319 dentists₆₃

Restorative



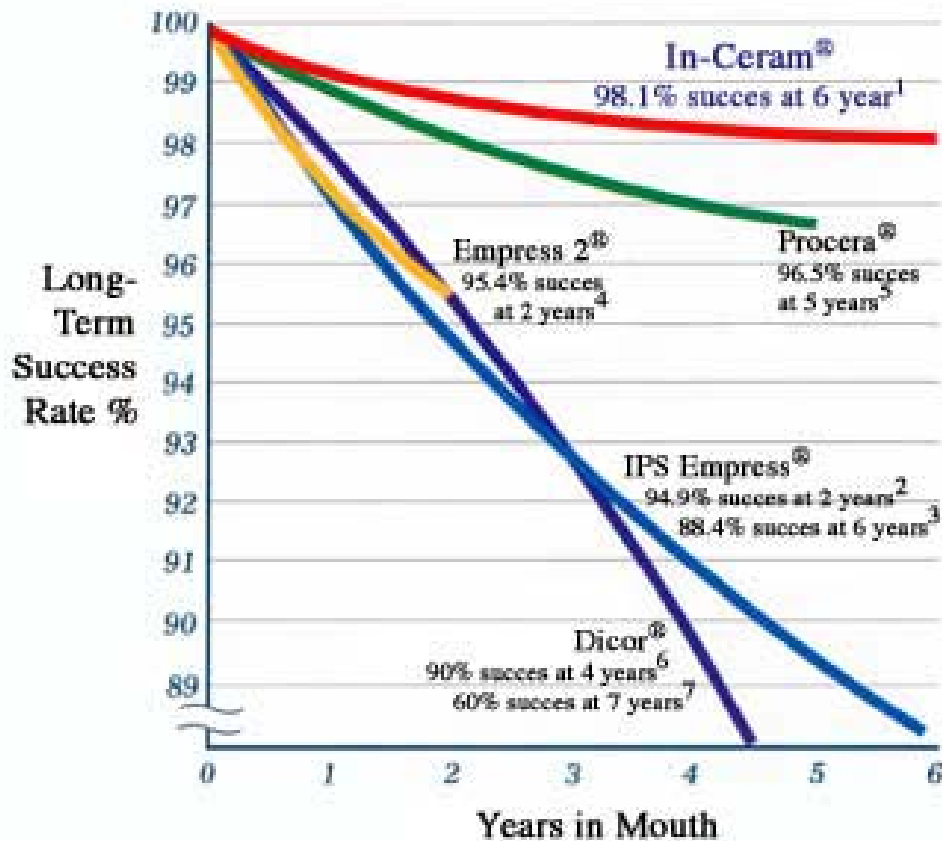
In-Ceram
LFC-Hi-Au



Procera
Galvano
/AGC



Empress
Metal-
ceram



1. Dr. A. Hüls. Georg-August University, Göttingen, Germany, 1996
2. Lehner, Studer, Brodbeck, Schärer. J Prosthodontics, 6:20-30, 1997
3. Lehner, Studer, Schärer. Abstract 1368, IADR, Nice, France 1998
4. IPS Empress 2 Technical Report, Copyright 1998 Ivoclar North America
5. Odin, Andersson, Krystek, Magnusson. Thesis at University of Umeå, 1996
6. Ellison, Lugassy, Setcos, Morfa. J Dental Research, 71:207, 1992
7. Ellison, Lugassy, Setcos, Morfa. J Dental Research, 71:207, 1992
8. Vita Zahnfabrik Technical Bulletin, 1998
9. Seghi, Sorensen. Int Journal of Prosthodontics, 8:239-246, 1995

Fibre-reinforced Composite

Laboratory

- FibreKor & Sculpture
- Vectris & Targis

Clinic

- Connect & BelleGlass
- Fiber-splint
- FibreSpan NSI & Nulite
- GlasSpan
- Ribbond & Revolution
- Ribbond Triaxial & Revolution
- Splint-it! & Flow-It! & Protect-It!
- Stick / Sticknet / Everstick

Glass

Kevlar

Polyethylene

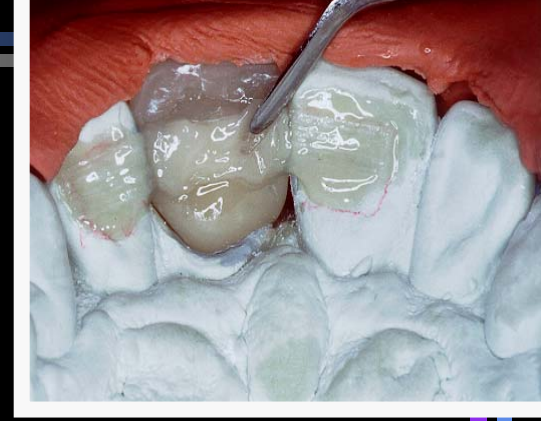
Pre-Impregnated

Mesh

Parallel

Twinned

66



New materials & methods—Fixed prosthetics

Rotating instrument

Root Post

Gingival retraction

Impression/ -tray

Bite & jaw registration

Color shade

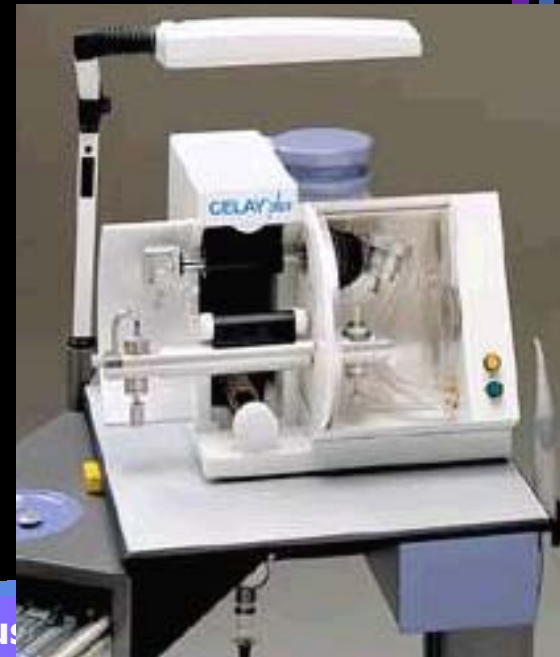
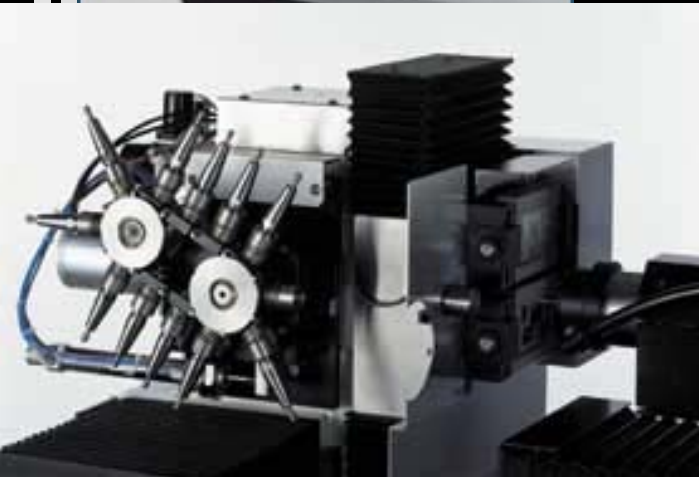
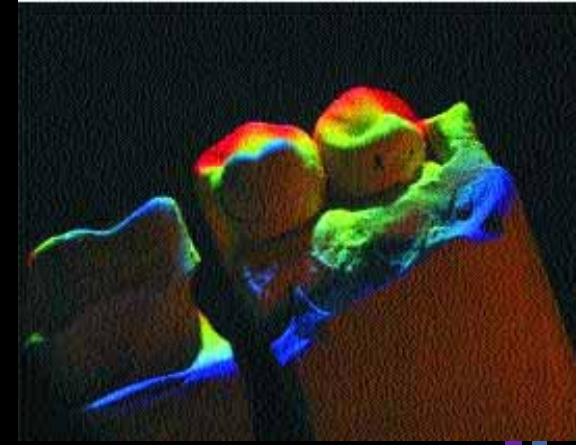
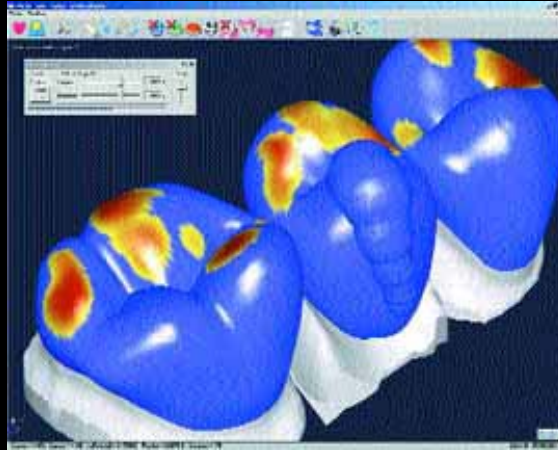
Temporary construction

Restorative materials

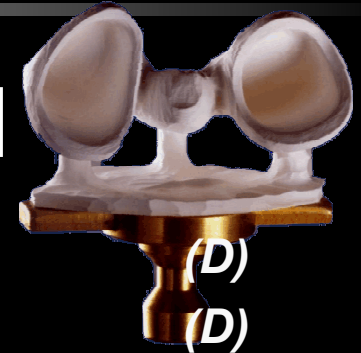


Production techniques

Production techniques- CAD-CAM (CAD-CAM)



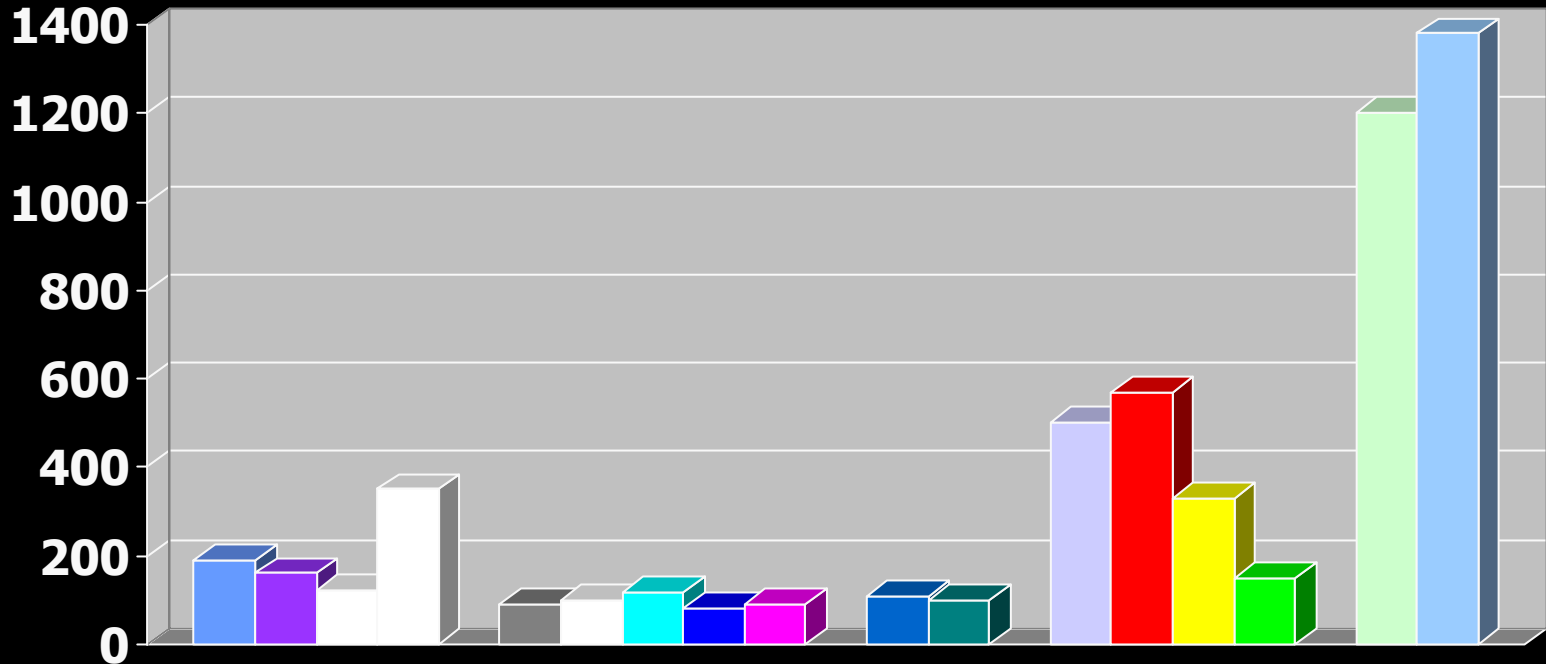
Production techniques- CAD-CAM



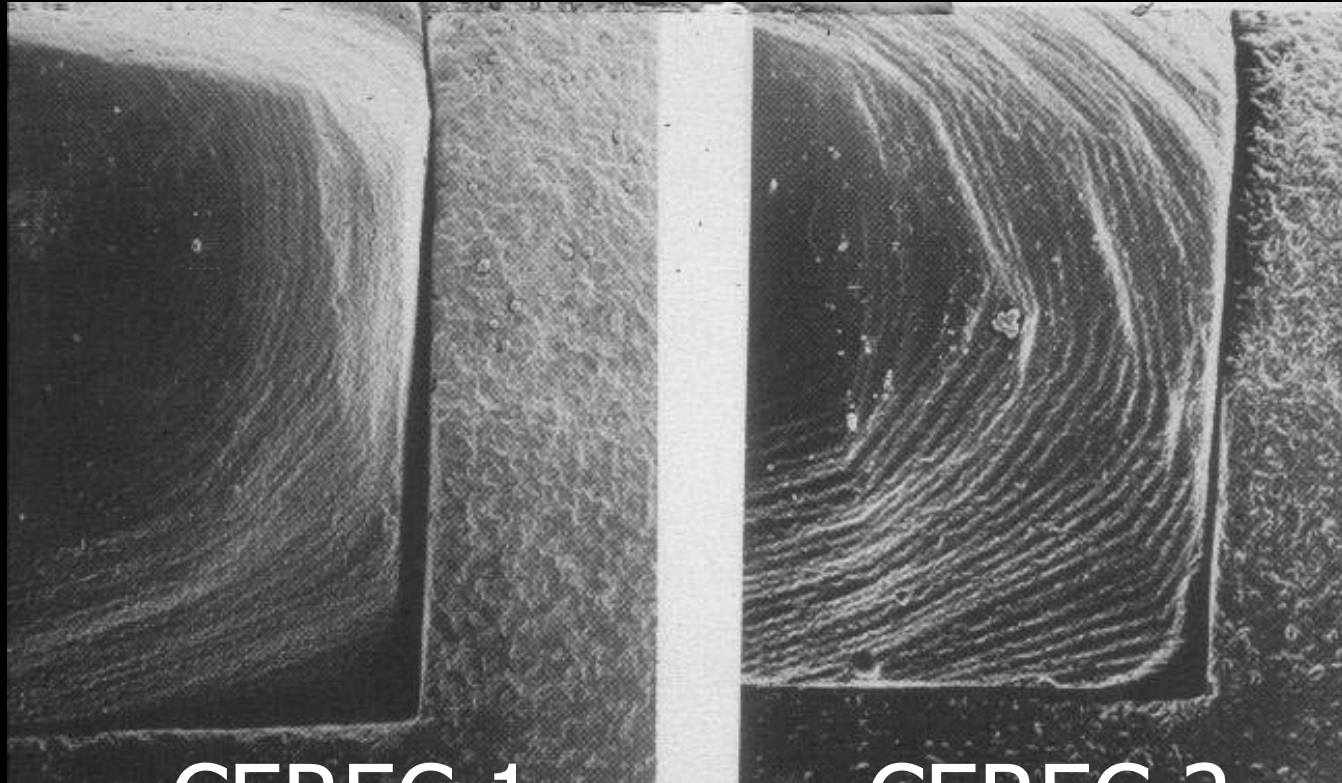
BEGO Medifactoring	BEGO Medical	(D)
CAD/CAM System	etkon	(D)
CELAY	Mikrona Technologie	(CH)
Cercon®	Dentsply/Degudent/Degussa Dental	(D)
CEREC3/CEREC Inlab	Sirona Dental Systems	(D)
CICERO®	Cicero Dental Systems	(NL)
DCS Precident	DCS Dental	(CH)
DECIM	DECIM	(S)
DENT. CAD/CAM GN-1	GC Corporation	(J)
digiDENT®	Girrbach Dental	(D)
Everest	KaVo Elektrotechnisches	(D)
Lava®	3M ESPE Dental	(D)
PRO 50	CYNOVADSM	(Can)
Procera®	Nobel Biocare	(S)
WOL-CERAM	WDT-Wolz-Dental-Technik	(D)
Xawex	Arnold Wohlend	(D)

1. Development of materials, e.g Ceramics

(Tensile strength, Mpa)



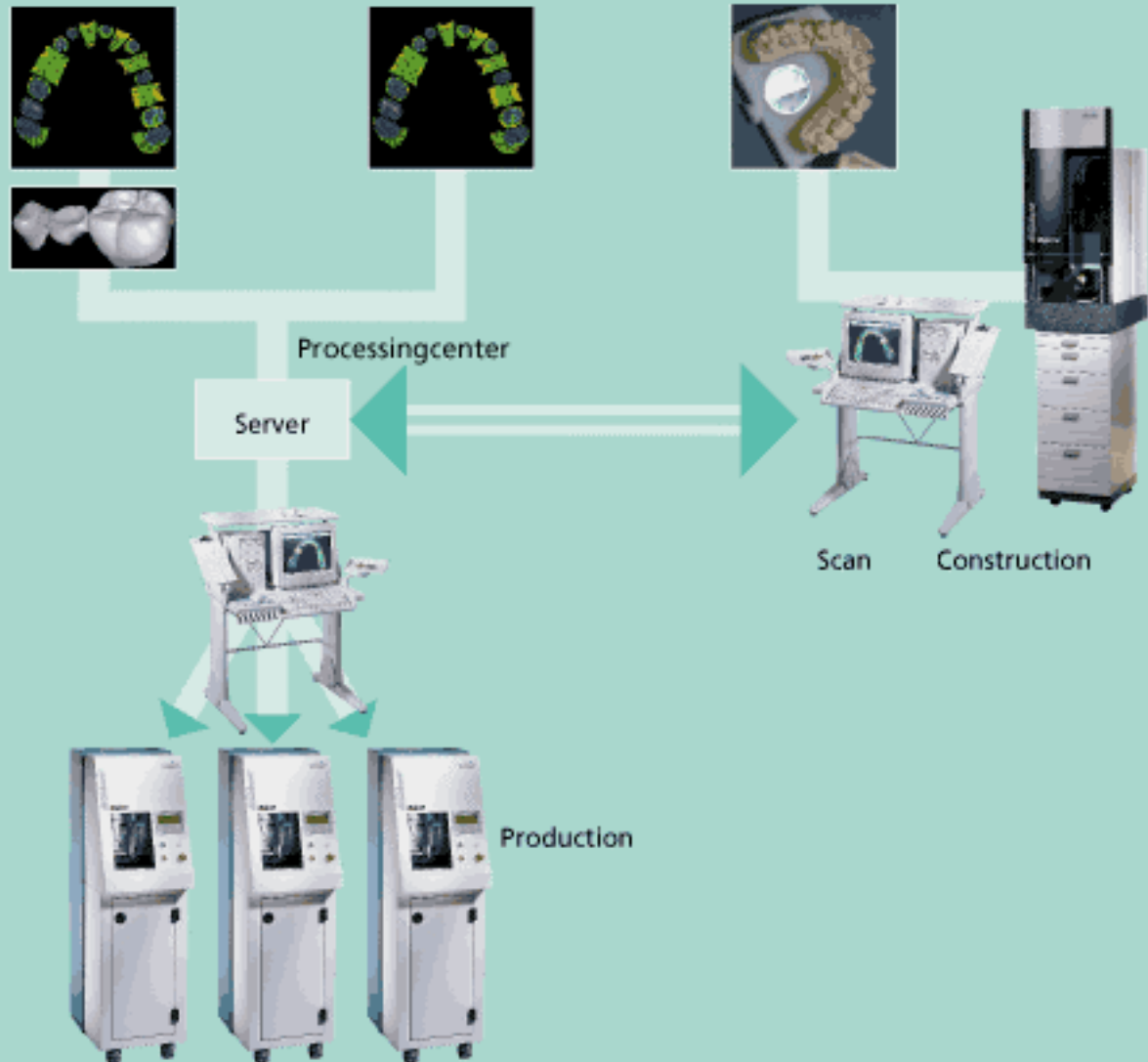
2. Development of software Time - precision



CEREC 1

CEREC 2

3. Development of production units



New materials & methods—Fixed prosthetics

Rotating instrument

Root Post

Gingival retraction

Impression/ -tray

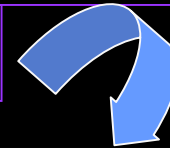
Bite & jaw registration

Color shade

Temporary construction

Restorative materials

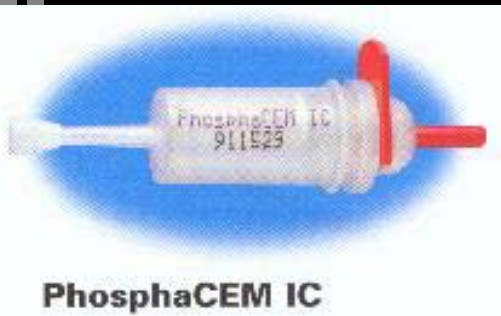
Production techniques



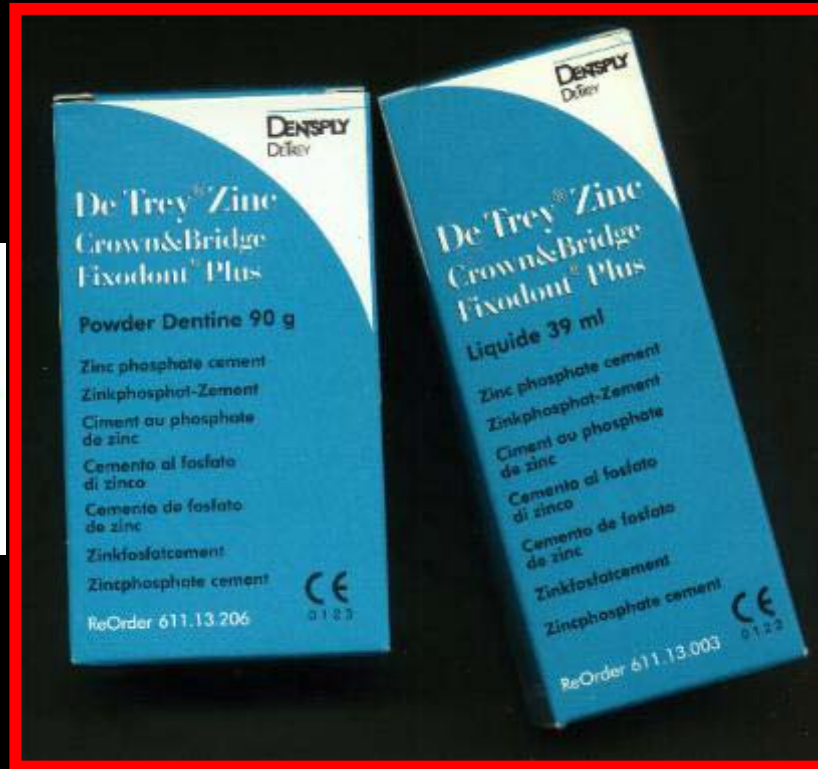
Cementation



Water-based - conventional



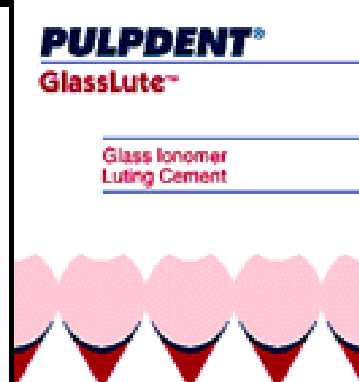
PhosphaCEM IC



Zinc-phosphate

Polycarboxylate

Water-based: Glassionomer



Resinmodified GIC & polyacrylate modified resin



Resin Cements

Light-Cured/Dual-Cure

1. **Insure/Insure Lite**
Cosmedent
2. **Variolink II**
Ivoclar Vivadent
- 3a. **Nexus2**
sds/Kerr
- 3b. **RelyX Veneer Cement**
3M ESPE
- 4a. **Choice**
Bisco
- 4b. **Illusion**
Bisco
5. **Calibra**
Dentsply/Caulk

Dual-Cure-Only

1. **Panavia F**
Kuraray
2. **RelyX ARC**
3M ESPE
3. **Bistite II DC**
Tokuyama Soda/
J. Morita USA
4. **Duo-Link**
Bisco
- 5a. **Cement-It!**
Universal C & B
Pentron
- 5b. **PermaFlo DC Indirect**
Luting/Restorative Resin
Ultradent

Self-Cure

1. **Panavia 21**
Kuraray
2. **Post Cement HI-X**
Bisco
- 3a. **C & B Metabond**
Parkell
- 3b. **M-Bond**
Tokuyama Soda/
J. Morita USA
4. **C&B Cement**
Luting Composite
Bisco

Most used cements in USA

	MC	Ceram
Hybrid ionomer	65%	46%
Adhesive resin	46%	63%
Glass ionomer	33%	

*Dental Products Report Survey, Nov 2000 n= 319 dentists.

Cementering av en IPS Empress ersättning



Ersättning

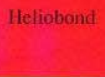
Kavitet



Förbehandling av IPS Empress keram:
Om inte arbetet har fluorvätesyra-behandlats hos tandteknikern, måste detta göras nu. Lägg på IPS Ceramic etsgel i 60 sek. Läs säkerhetsföreskrifterna!



Vid "totalts":
10 sek på dentinet



Placera ersättning



Tag bort överskott

Ljushärda



Grov och finpolering
av cementspalt

Fluorlackning



Cementering av kompositersättning

Cementeringsschema för adhesiv cementering av komposit ersättning med Variolink



Ersättning

Kavitet



Förbehandling av kompositen:
Rugga upp ytan med en finisheringsdiamant 25 µm



Vid total
ets, 10 sek
på dentinet



Placera ersättning



Tag bort överskott

Ljushärda



Grov och finpolering
av cementspalt



* I. Mjölktänder och kraftig fluoriderad emalj skall etsas längre

Zinkphosphate cement

- 1. Clean surface with H₂O₂, wash, dry**
- 2. Mix powder and liquid**
- 3. Apply cement in crown**
- 4. Place crown on prepared tooth**
- 5. Wait**
- 6. Remove surplus with probe**
- 7. Inspect crown margin**



Thank
you for
your
kind
attention