Incognito™ Clear Precision Tray

Master Presentation to share

Dr. Carolin Wiedig, Global Professional Service Manager, February 2014

Incognito™ Appliance System

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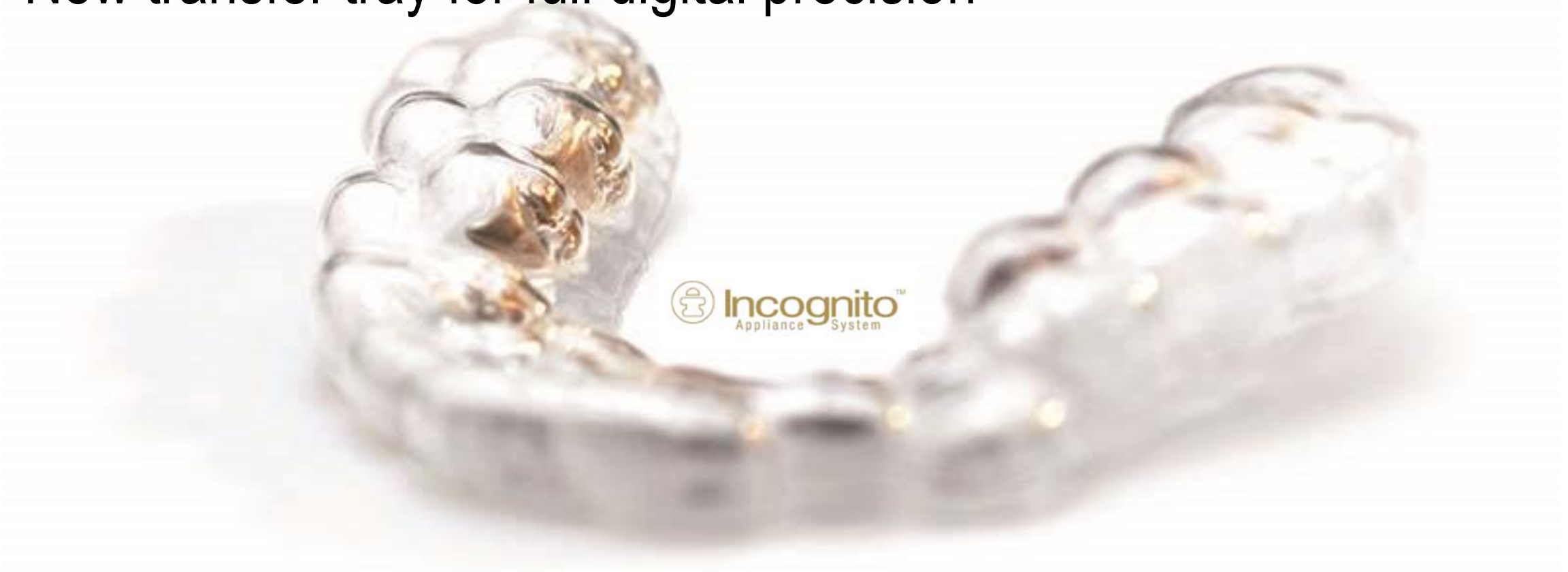
Incognito™ Clear Precision Tray

New transfer tray for full digital precision



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Presentation Overview

- Incognito™ System Digital Workflow
- The Incognito Clear Precision Tray
- Manufacturing the Clear Precision Tray
- Research Results
- Bonding with the Clear Precision Tray
- The Incognito Clear Precision Tray in Clinical Use
- How to order

Incognito™ System Digital Manufacturing Workflow

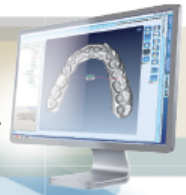
1. 3M™ True Definition Scanner*
Take your impressions for the Incognito System digitally.

*Not available in all countries

2. Unitek™ Treatment Management Portal
Ordering software leads you conveniently through the process.

3. Digital Setup Lab
Highly precise Digital Setups are produced by 3M technicians.

4. Unitek™ Treatment Management Portal
View, evaluate and approve Setups in 3D.



5. Computer-Aided Bracket Design
Customized bracket pads and bases are designed on the lingual surface of the digital model.

Full digital control in all procedure steps

6. Bracket Manufacturing
The brackets are precision made in dental gold. Using a multi-step process.

7. Incognito™ Clear Precision Tray
This highly precise bonding tray is produced directly from digital data eliminating manual steps.

8. 3D Printed Models
There is an option to order a 3D Setup Model and/or Malocclusion Model.

9. Archwire Bending
Custom archwire geometry is determined by the CAD/CAM software.

10. Quality Assurance and Shipping
Strict quality control measures are taken at each stage of the manufacturing process. Before shipping, a final quality check is carried out.

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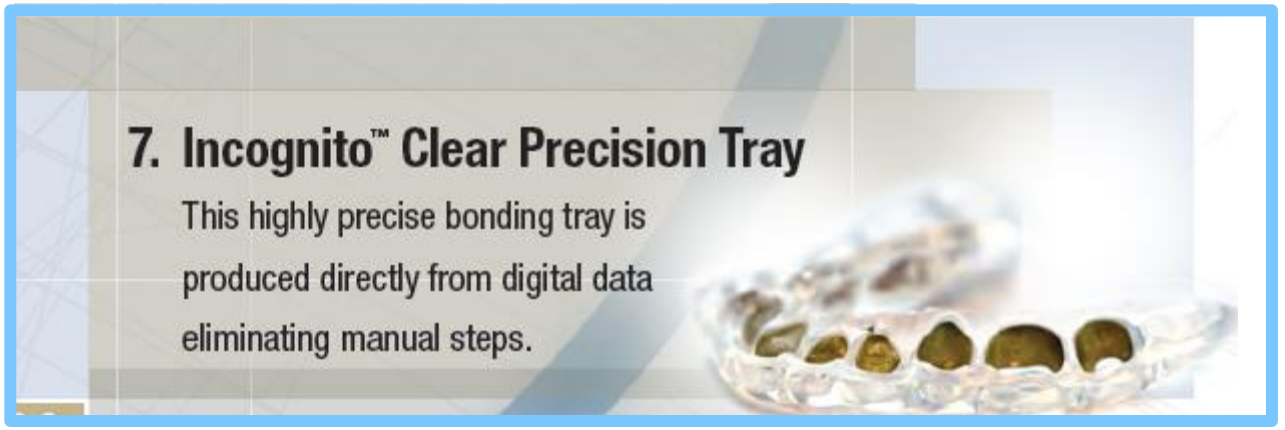
The Digital Manufacturing Workflow and the Clear Precision Tray

- With the Clear Precision Tray you receive a fully digitally manufactured Incognito Case
- Only available with DSL cases
- Bracket position is digitally defined, no manual steps needed



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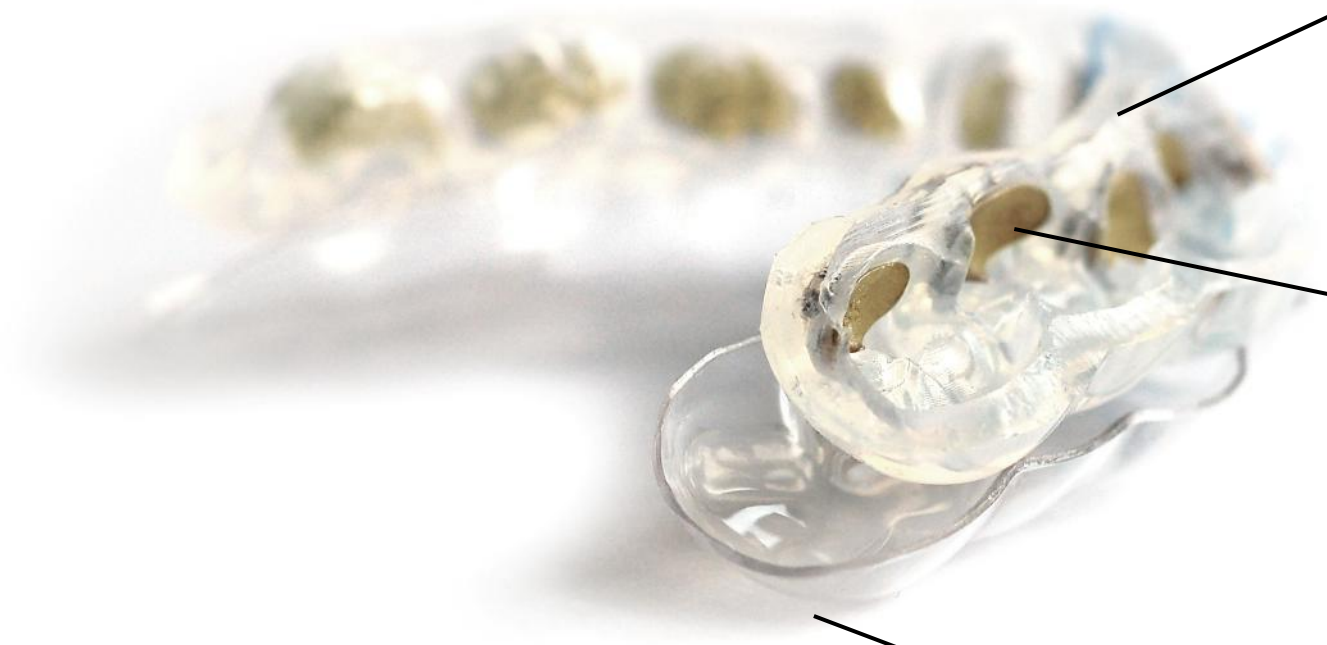
The Incognito™ Clear Precision Tray



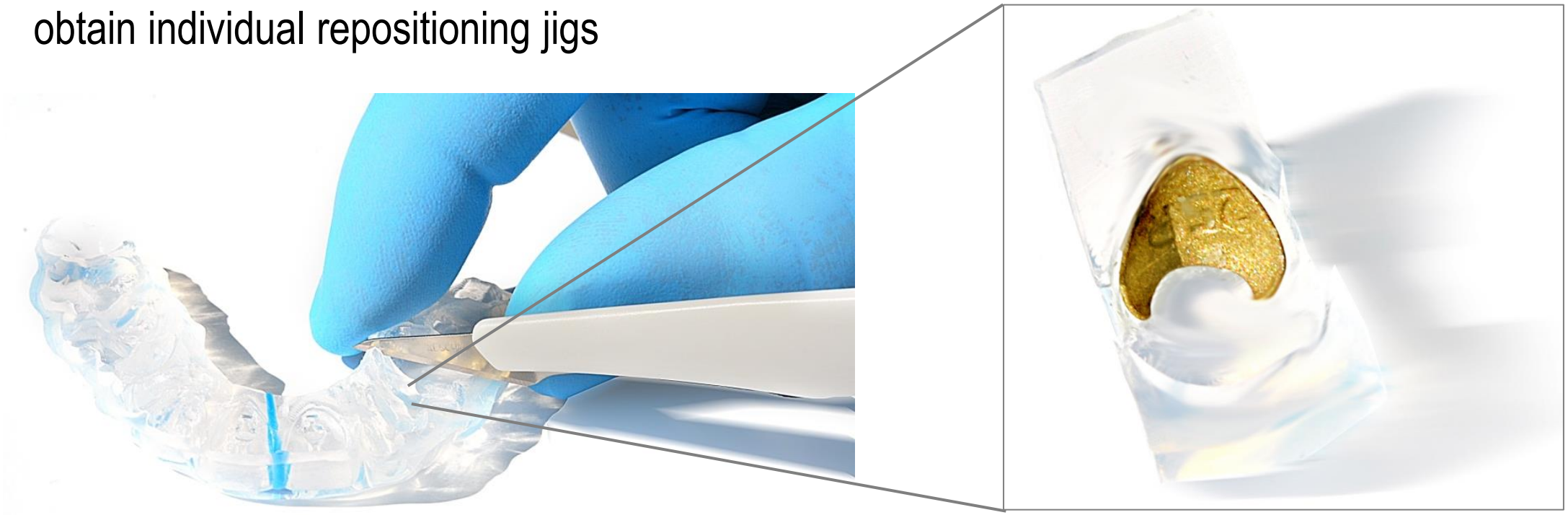
Inner, transparent silicone tray with digitally defined bracket spaces

Incognito Brackets with sandblasted surface in digitally defined position

Hard, transparent outer shell for stable positioning

Incognito™ Clear Precision Tray

Inner, transparent silicone tray can be cut to obtain individual repositioning jigs



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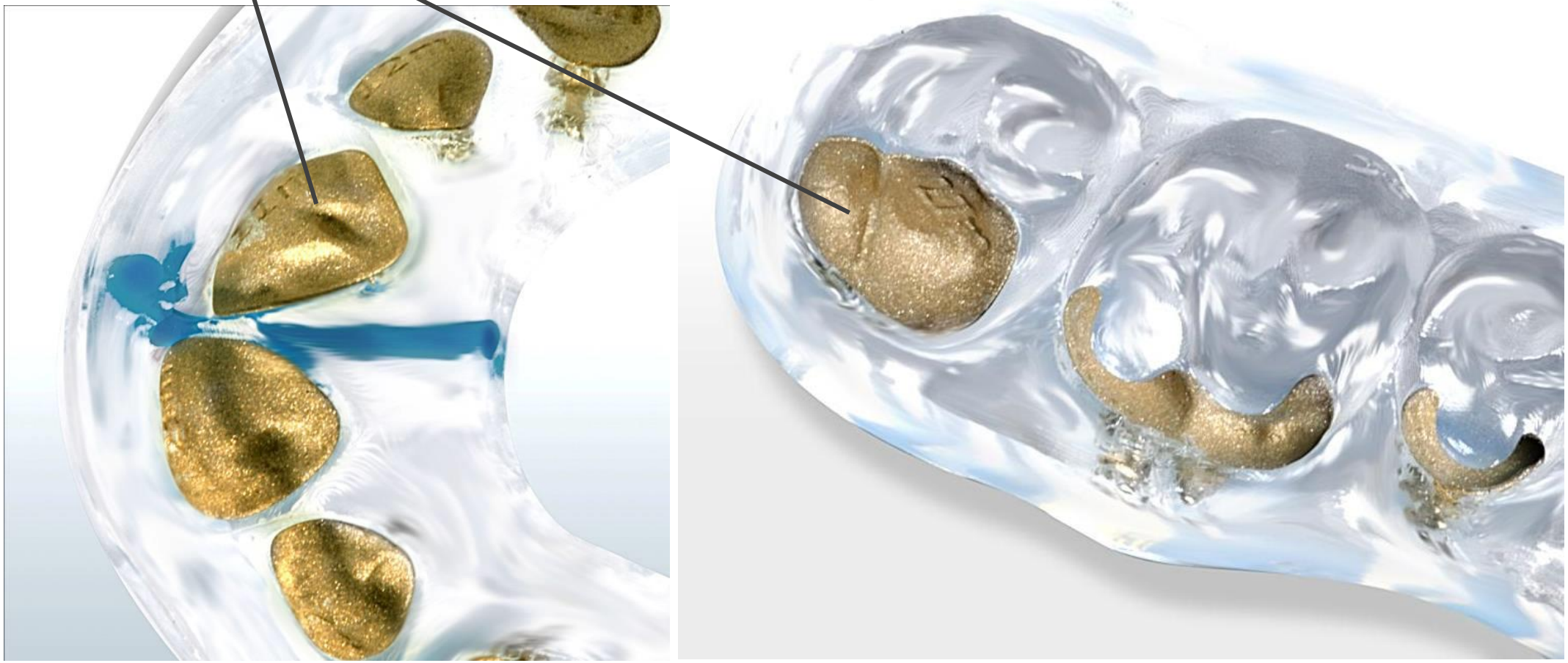
Incognito™ Clear Precision Tray

Brackets adapt to the lingual surface – no custom resin base



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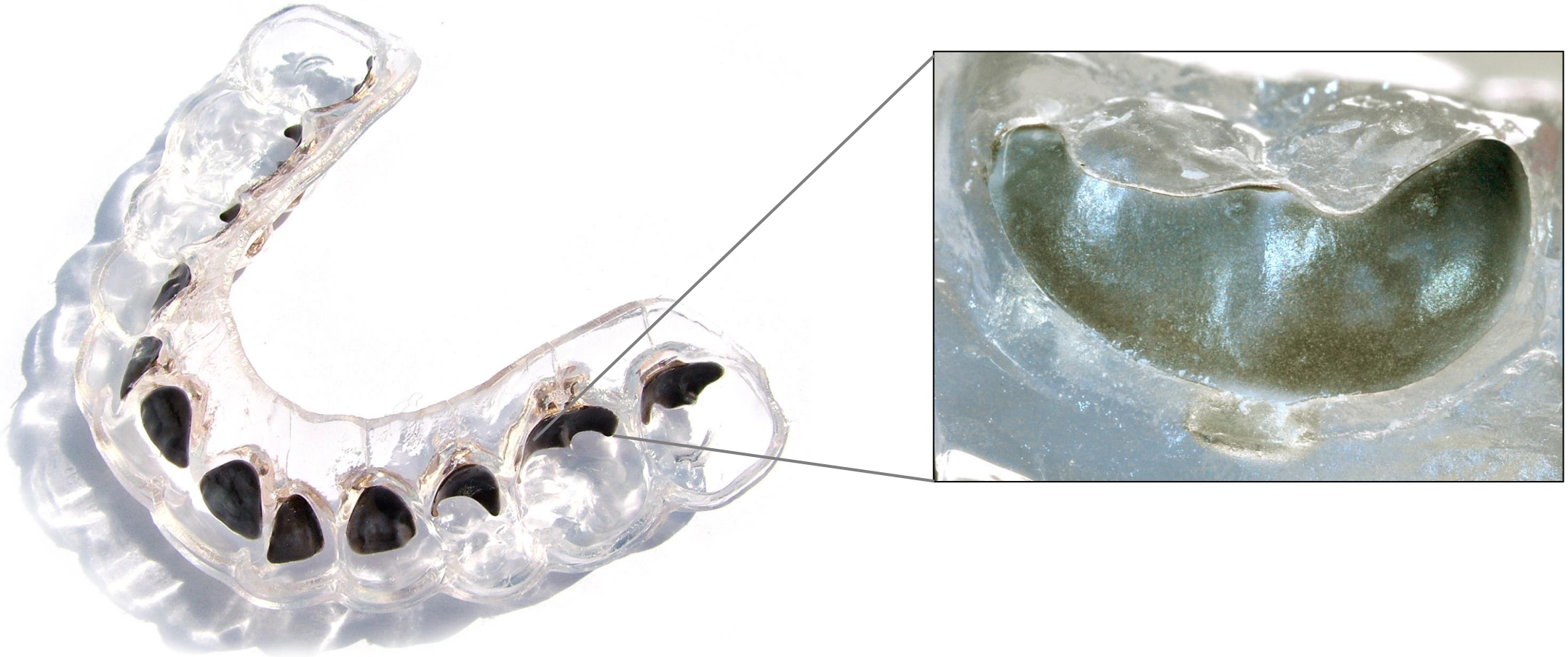
Previous Clear Transfer Tray and Custom Resin Base



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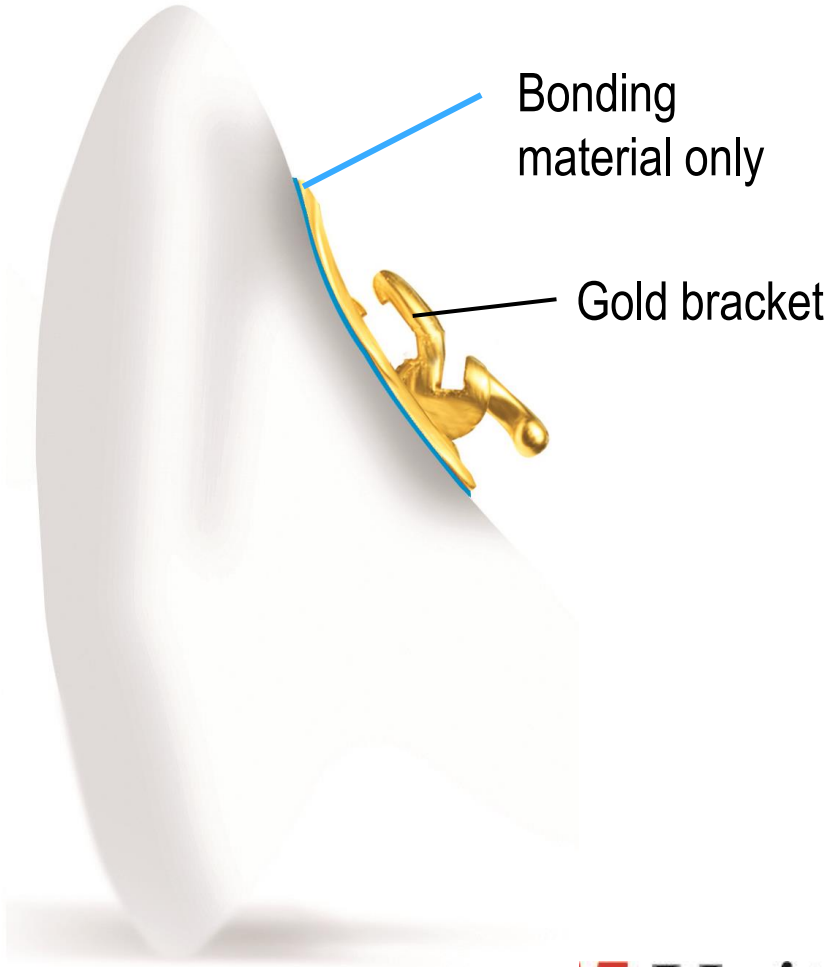
Incognito™ Clear Precision Tray

With custom resin base

Schematic profile of fully customized Incognito bracket with custom resin base versus other available bracket systems

No custom resin base



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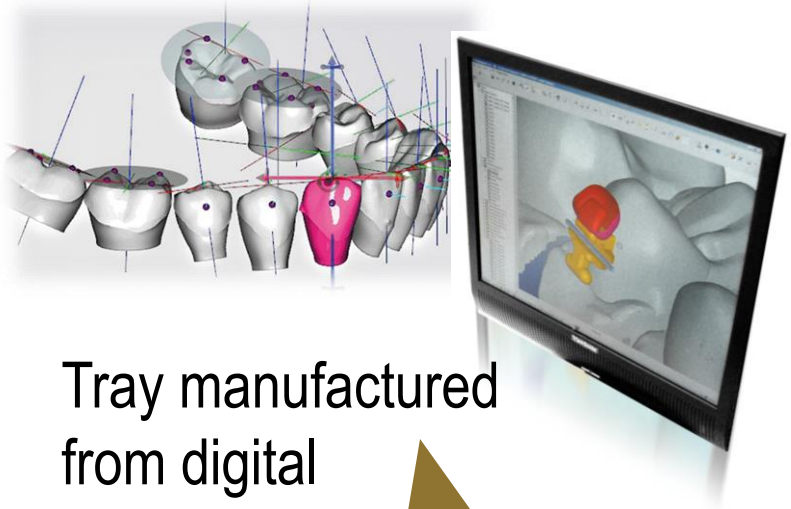
Manufacturing of the Incognito™ Clear Precision Tray



Tray manufactured from digital data

Bracket insertion into prefabricated tray

Completed Tray

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Manufacturing of the current Incognito™ Double SiliconeTray

Conventional Tray (here: 2-Phase Silicone)

Visual guidance for bracket positioning

Bracket positioning on stone model

Tray fabrication over stone model with brackets

Completed Tray

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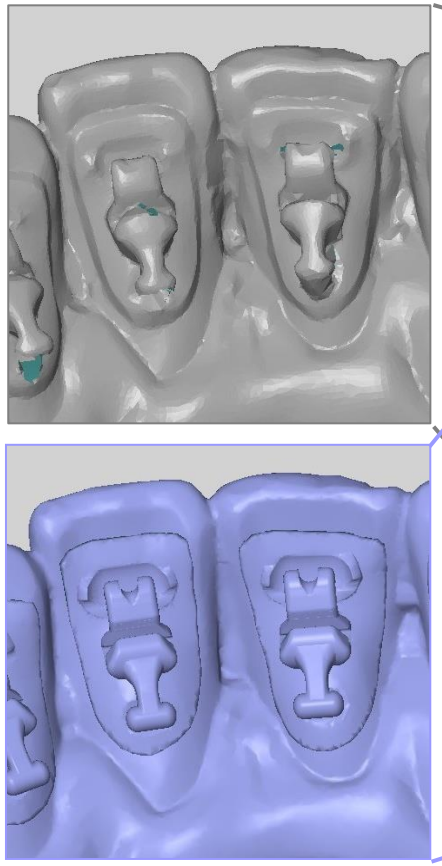
Research Results

Accuracy of bracket positioning

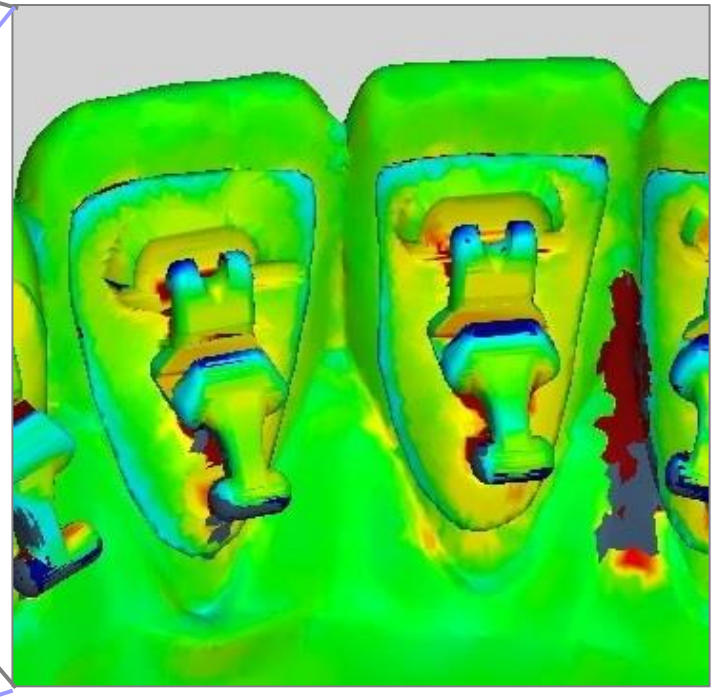
Test design: compare bracket position in 10 arches/group and assess deviation in mesio-distal and occlusal-gingival relation

Scan of bonded brackets

Design data



Overlay



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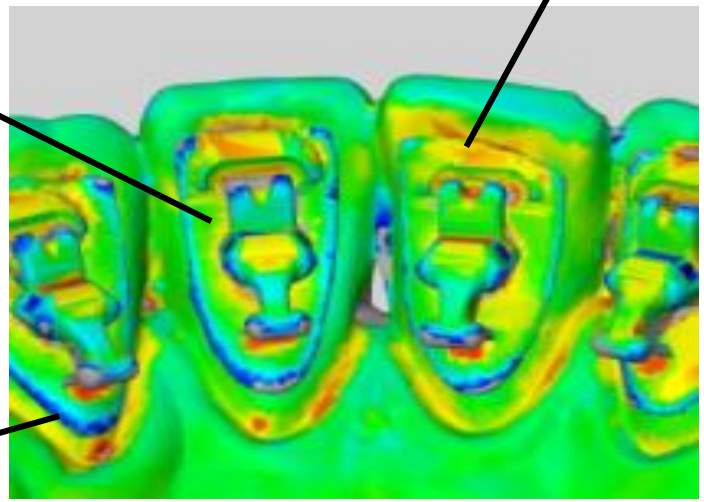
Research Results

Explanations for internal training

Accuracy of bracket positioning: What do you see?

Green: exact match

Red: more material on bonded arch. Here excess from bonding



Blue: less material on bonded arch. Here material loss by bracket tumbling

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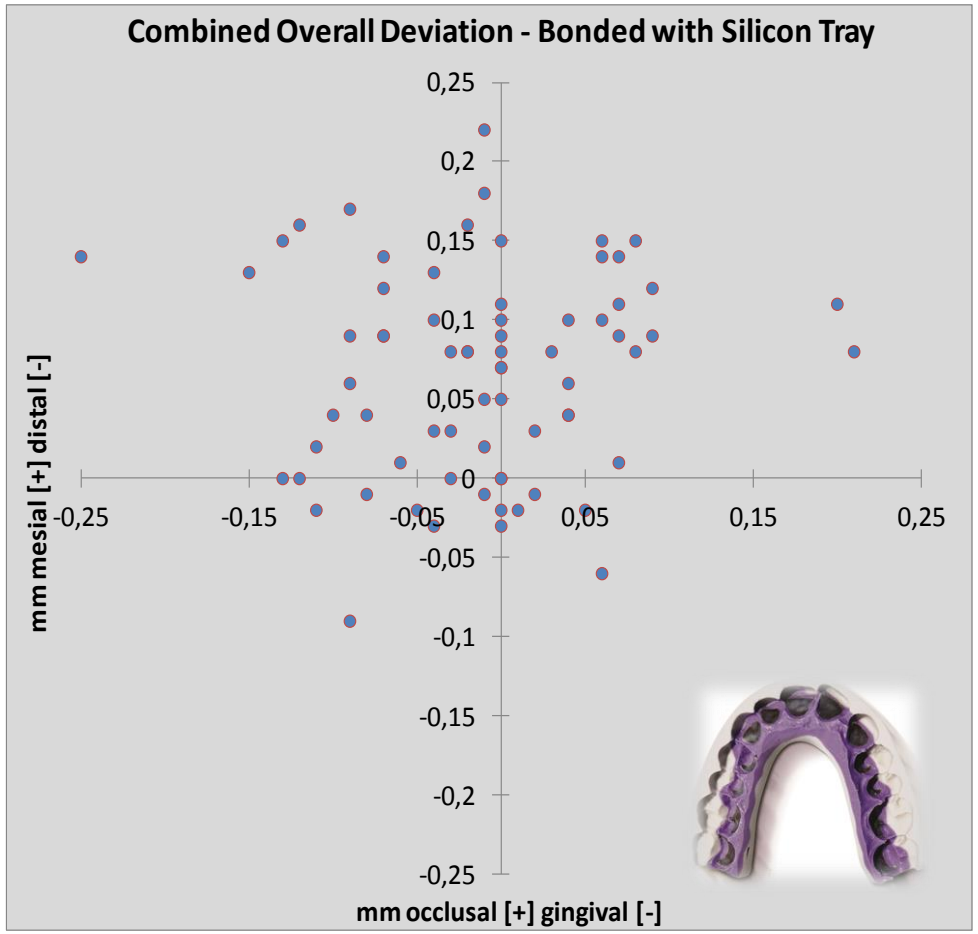
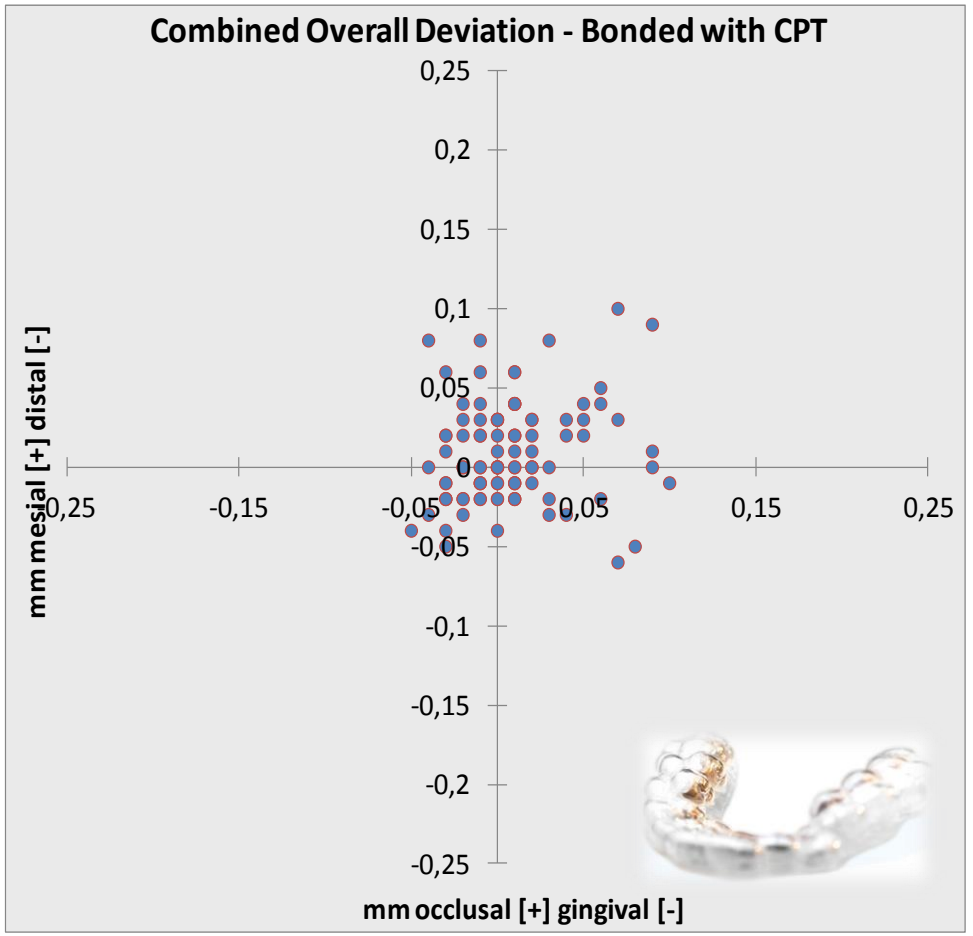
Research Results

Accuracy of bracket positioning





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Research Results

Maximum deviation in manual process done by trained individuals: 0.2 mm

Mean deviation manual: 0.06 mm

1 human hair ~ 0,06 mm

1 pixel on the Retina display: 0.078 mm

Maximum deviation in digital process: 0.1 mm

1 sheet of paper = 0.1 mm

Mean deviation digital: 0.02 mm

Spreading reduced

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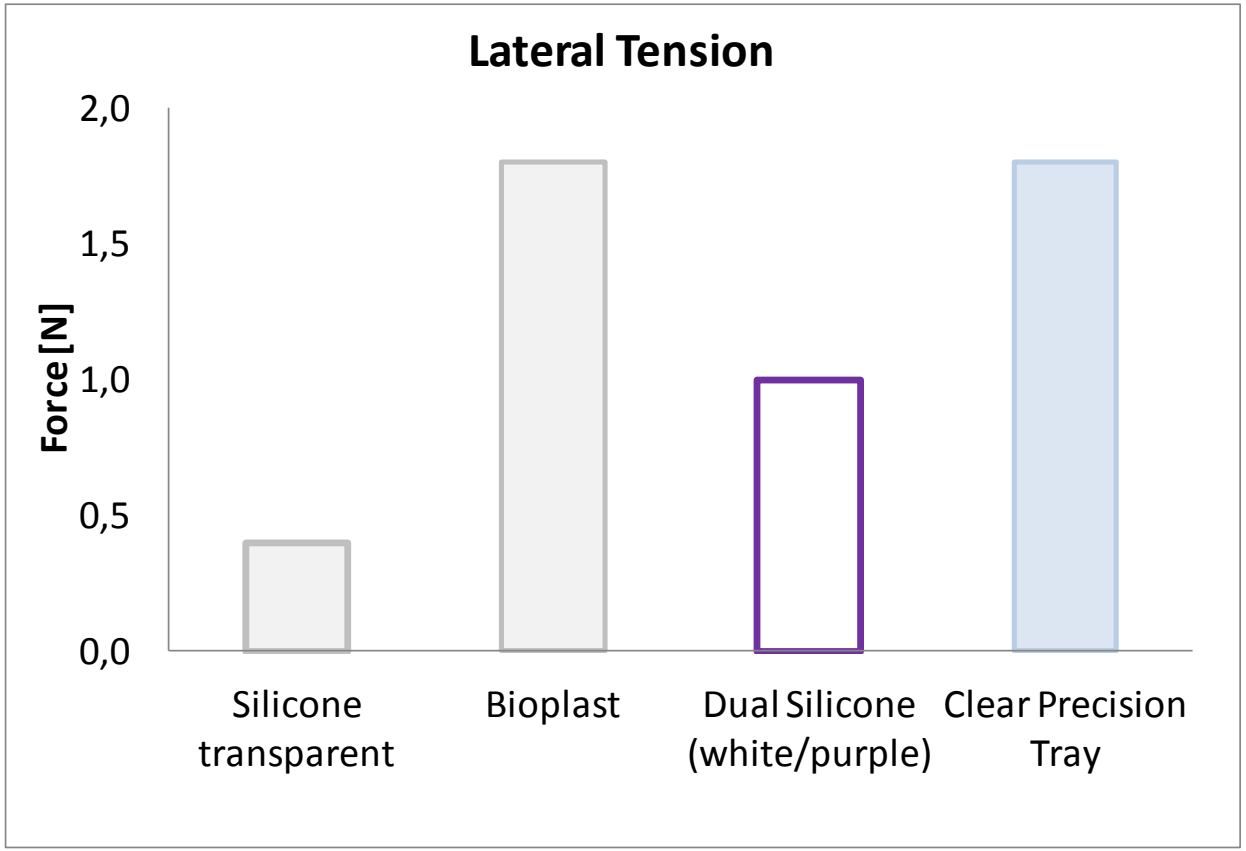
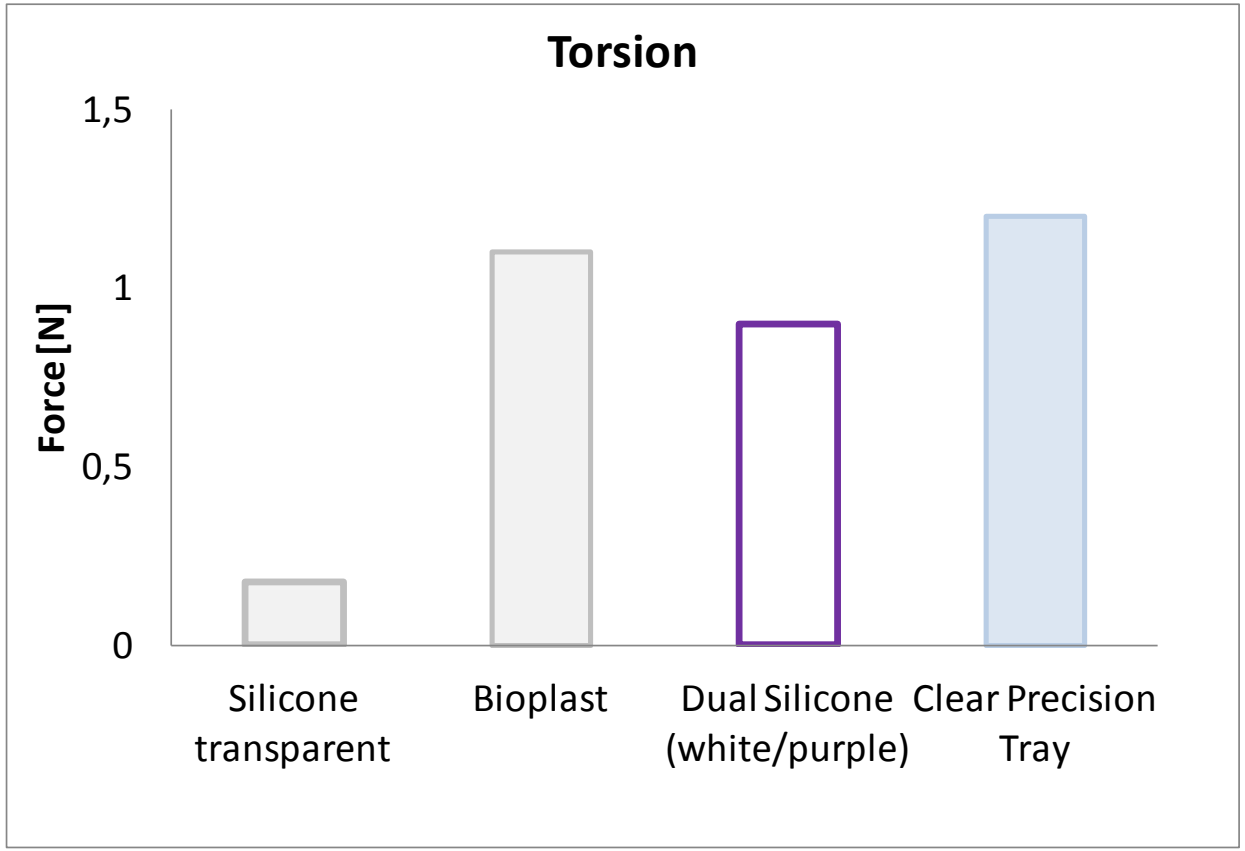
Research Results

- Incognito™ Clear Precision Tray shows comparable or higher stiffness than existing transfer trays





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Bonding with the Incognito™ Clear Precision Tray

- Recommended material:
  Rely X Unicem 2 Automix
  Self Adhesive Resin Cement

- New production process
  ⟶ no custom resin base on the brackets

- Filled bonding material is recommended for Incognito™ Clear Precision Tray, unfilled materials are under evaluation

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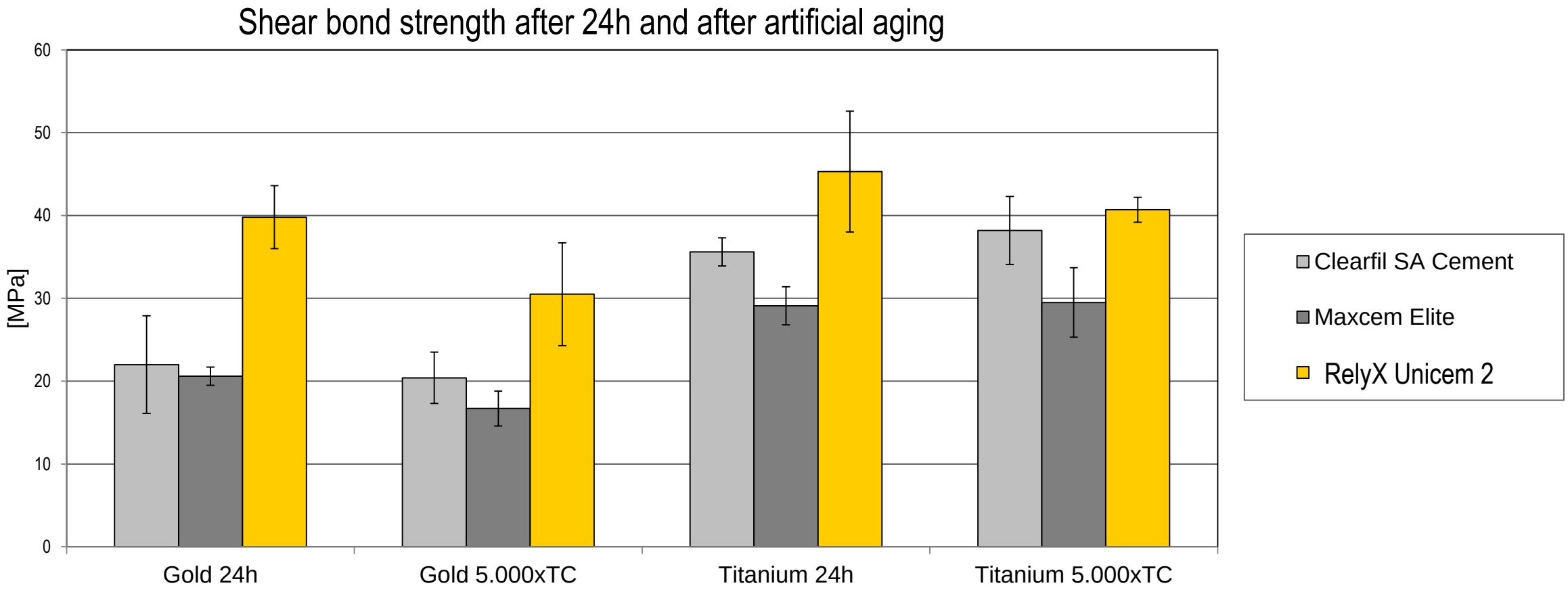
Why RelyX™ Unicem 2 Automix?

Proven in dentistry for years for simple use and good adhesion to sandblasted metal



AADR/IADR 2011 San Diego # 521, Syrek et al.

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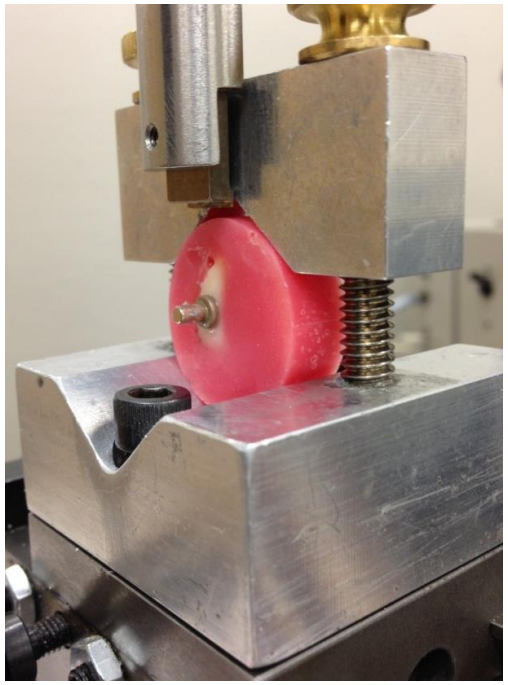
RelyX™ Unicem 2 Automix for Incognito™ Clear Precision Tray

Bonded human & bovine arches

Bond strength testing
- At tray removal
- After 1 day
- After storage or artificial aging
- Different tooth pretreatment
- Different bracket pretreatment

Debonding tests

Tooth samples



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RelyX™ Unicem 2 Automix for Incognito™ Clear Precision Tray

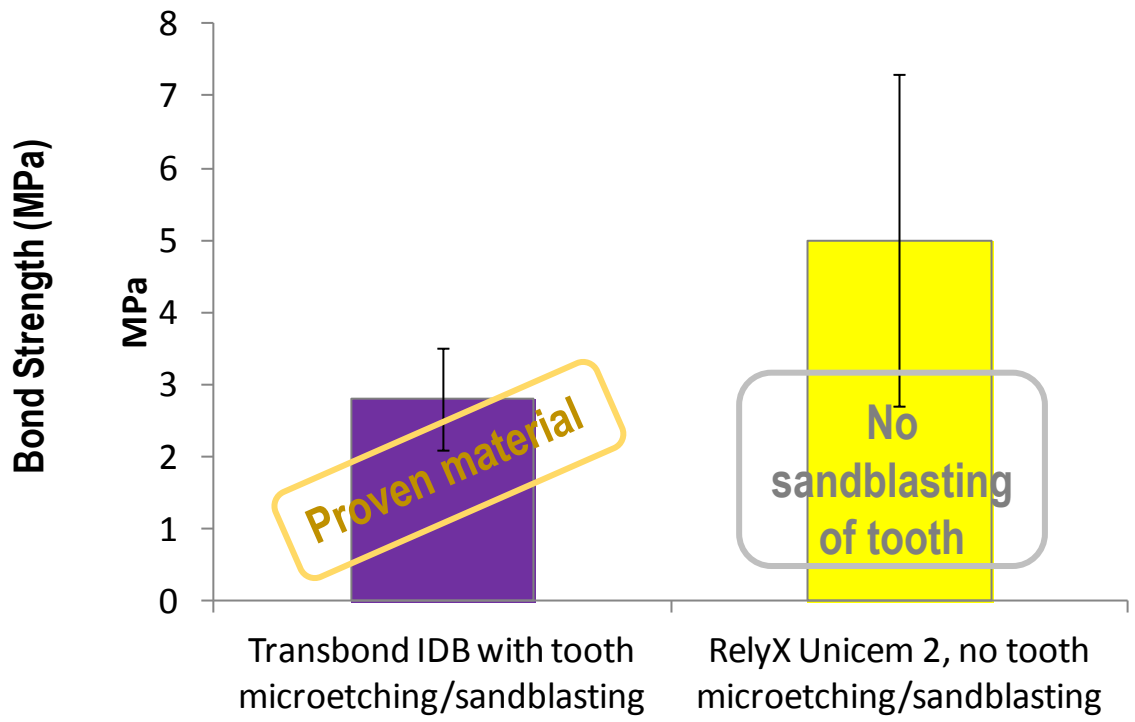
Tooth Pretreatment:

Bond strength of RelyX Unicem 2 on teeth that were ***not sandblasted, just thoroughly pumice cleaned*** is equal or superior to previous proven bonding recommendations

Bond Strength (lb./brkt.)

Shear bond strength to bovine teeth

Bond strength to human enamel after artificial aging



Shear bond strength to human teeth

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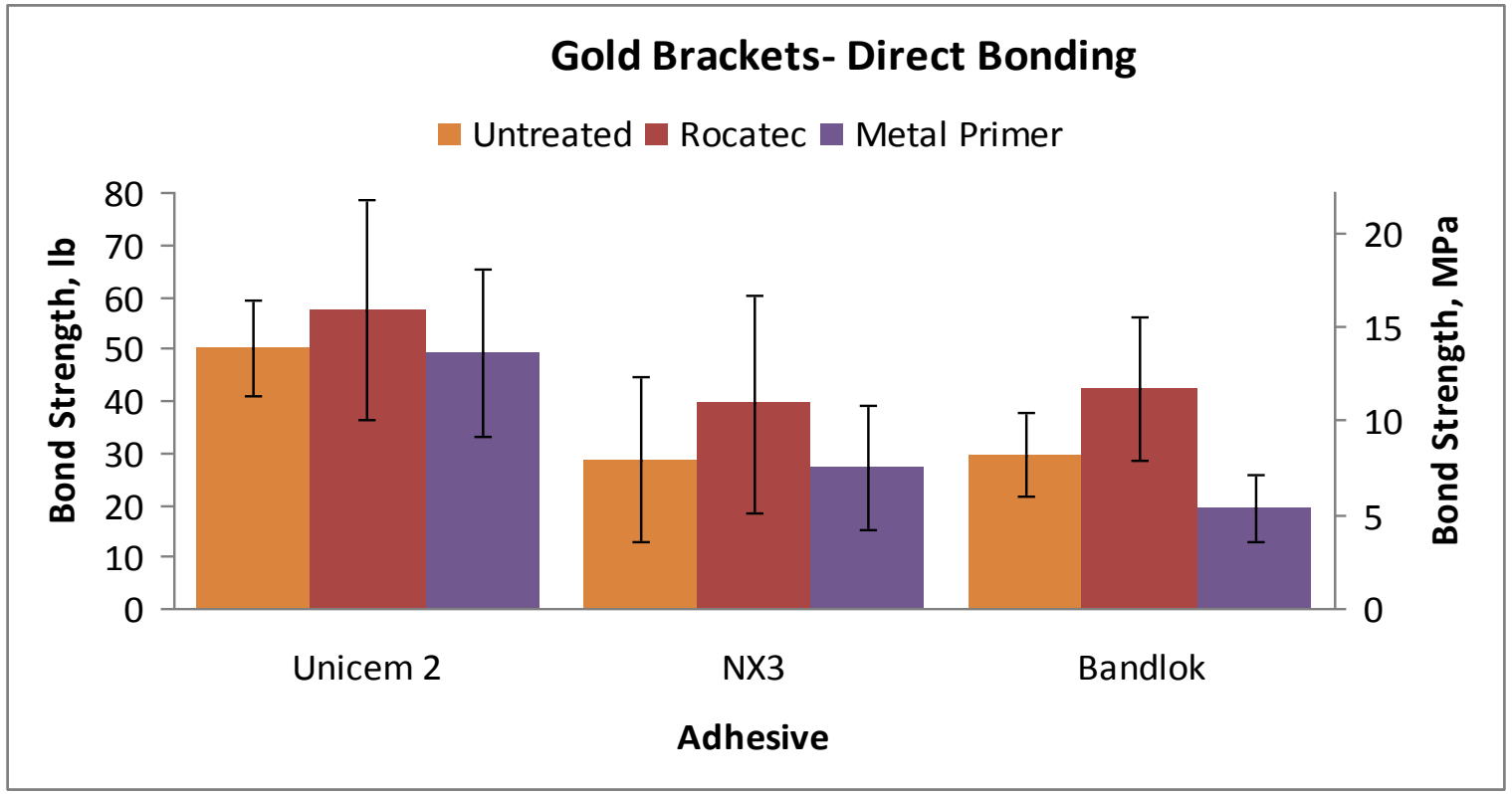
RelyX™ Unicem 2 Automix for Incognito™ Clear Precision Tray



N=10, The bovine tooth was microetched with 50-micron aluminum oxide, etched with phosphoric acid etching gel, rinsed and air dried. The bracket was used sandblasted and cleaned and was bonded to the enamel The bonded teeth were stored for 16-24 hours in 37ºC water and subjected to shear bond strength test

No Metal Primer needed with RelyX Unicem 2 Automix

Neither Metal Primer nor Rocatec or Cojet silicatization & silane pretreatment further increased bond strength to gold.

Confirmed by D.Segner, Hamburg, Germany in separate testing.

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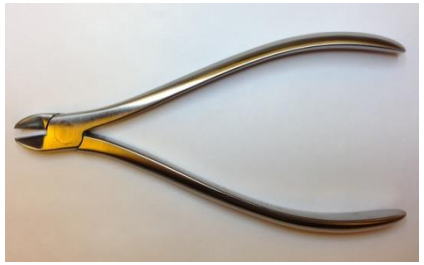
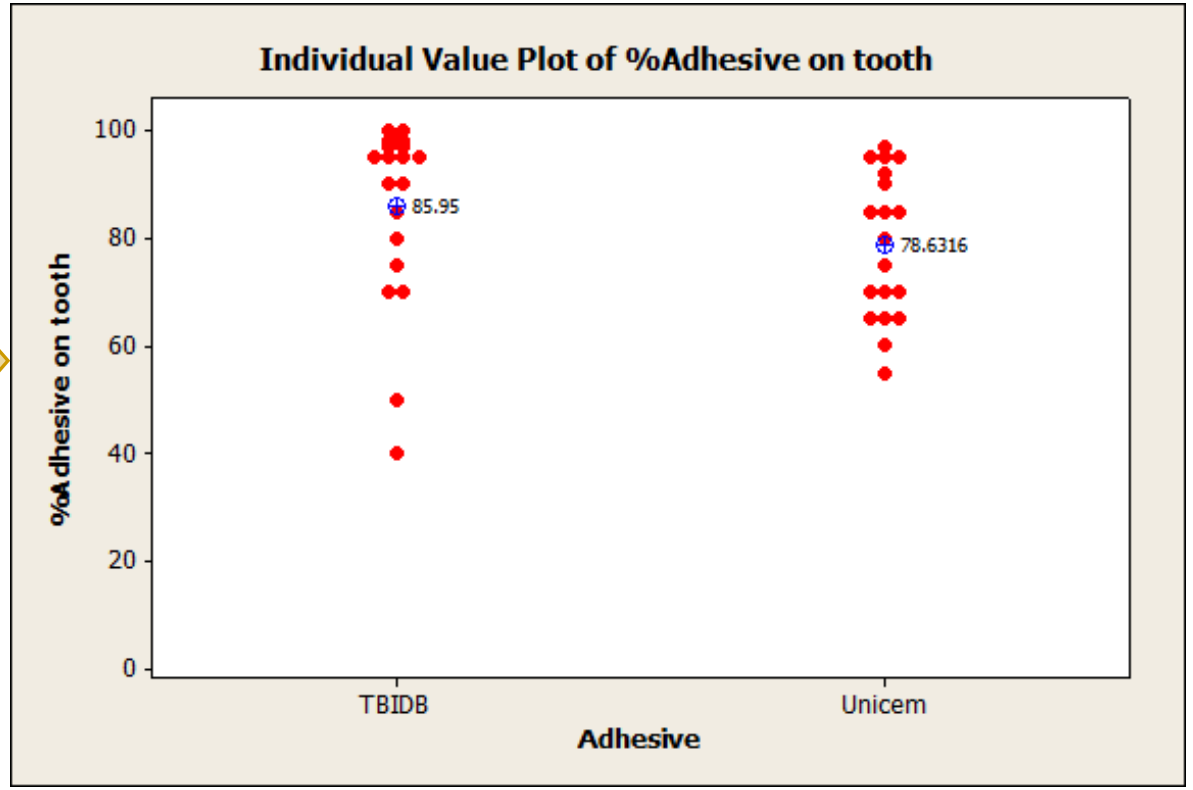
RelyX™ Unicem 2 Automix for Incognito™ Clear Precision Tray Debonding Safety





N= 19 (RXU) and 20 (TBIDB). ***No enamel damage was observed*** in any of the debondings. Most adhesive remained on tooth after debonding, which indicates low risk of enamel damage.

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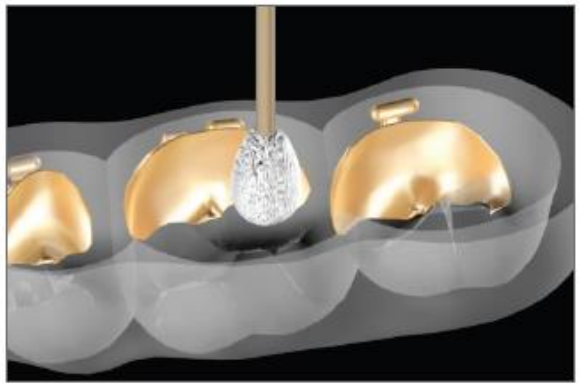
Bonding with the Incognito™ Clear Precision Tray

Step by Step

01

Verify the fit of the transfer tray.



02

Clean the bracket surface with 100% acetone using a cotton pellet.

03a

Clean the lingual surfaces thoroughly with pumice slurry and rinse with a water spray.

03b

Alternative: Intraoral micro-etching
Make sure that you don't hurt the gingiva while micro-etching. Cover the patient's face to protect it from the powder. Rinse well!

Tooth surface must be clean

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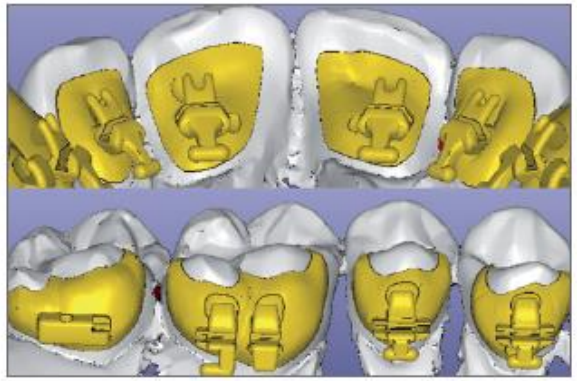
Bonding with the Incognito™ Clear Precision Tray

Step by Step

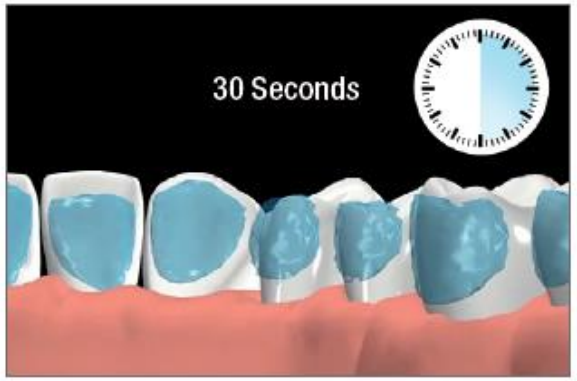
04

Insert the Dry Tips in each cheek and place the Nola Dry Field System.



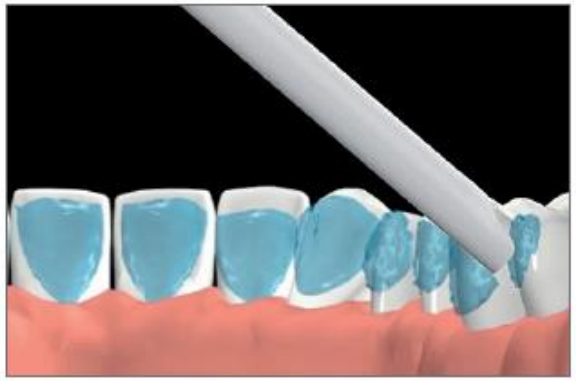
05

Use screenshot to reference all surfaces that need to be phosphoric acid etched.



06

Etch the lingual surface of all bonded teeth with 35% phosphoric acid for 30 seconds. Use screenshot for reference and check visually.



07

Remove etching gel with suction.

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Bonding with the Incognito™ Clear Precision Tray

Step by Step

08

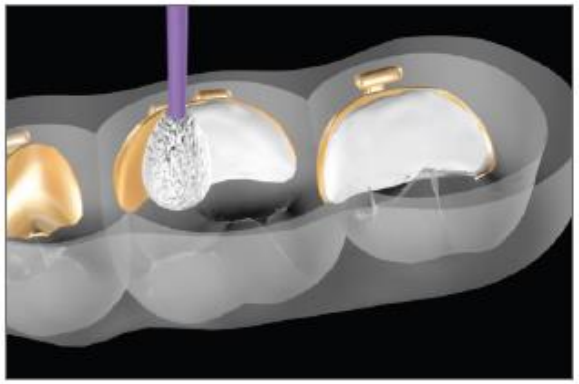
Rinse with water.

09

Carefully dry using oil-free and moisture-free air. Check etching result with the mirror.

10

RelyX™ Unicem 2 Automix is a dual cure self – adhesive resin cement. The mixing tip facilitates dosing and mixing. Do not cross-contaminate the outlets of the syringe. Please observe the working time of 2 min 30 sec.



11

Using either the mixing tip or a micro-brush, apply a thin layer of bonding material to the bracket bases in the transfer tray. Control the amount of bonding material used. Too small amounts may result in gaps under the bracket bases. Too large amounts will create excessive flash / excess.

No metal primer on brackets.
Important to spread material in a thin but even layer

Bonding with the Incognito™ Clear Precision Tray

Step by Step

12

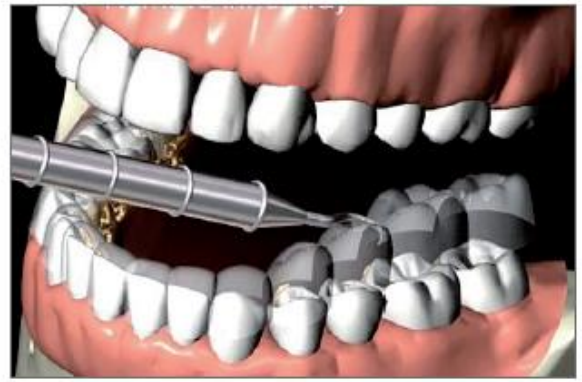
Insert the transfer tray and hold in position while the assistant positions the curing light.

13

Hold the light guide as close as possible, curing for 3 seconds (total 12 sec. cure) on all four sides of the bracket using the Ortholux™ Luminous Curing Light. *

14

Remove the Nola Dry Field system first, then the Clear Precision Tray. Start with the outer rigid layer, work from posterior to anterior and from buccal to lingual (use scaler if necessary).



15

Then remove the softer inner layer, again beginning in the posterior and working forward, and from the buccal to the lingual side.

* Curing time depends on power of your curing light. With less power, the required curing time increases. Please refer to manufacturer's instructions.

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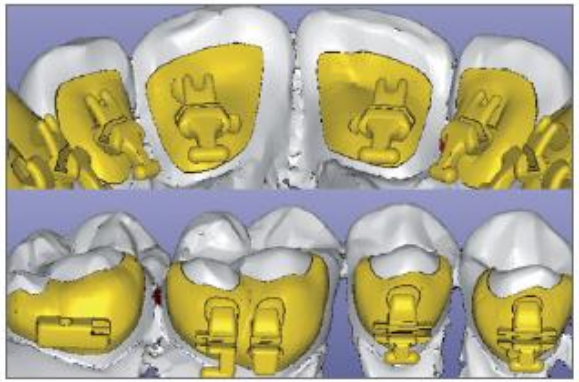
Bonding with the Incognito™ Clear Precision Tray

Step by Step



16

Use the screen shots to check that all the brackets are positioned correctly.

17

Remove any excess bonding agent from the brackets and the interproximal contacts using a scaler and dental floss. If necessary, use slow speed finishing burr.

18

Use dental floss to check that all the inter-proximal gaps are open. Use serrated strips if neccessary. Don't forget to clean the occlusal and labial surfaces.

19

Check the bracket slots, tubes, wings and hooks for any remains of silicone from the bonding tray. This ensures proper wire fit and ligation.

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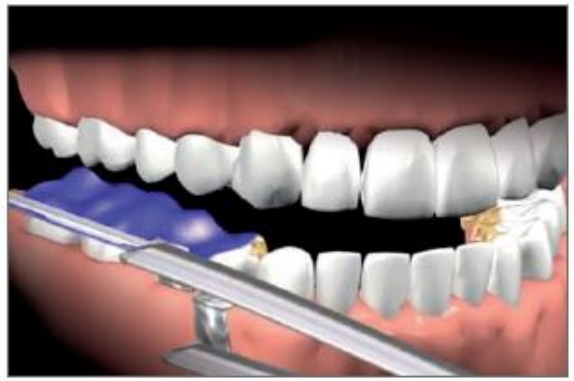
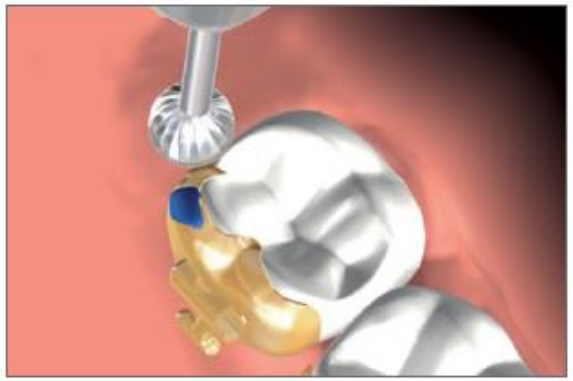
Bonding with the Incognito™ Clear Precision Tray

Step by Step



20

Carefully check for premature contacts on the bracket bases in the lateral tooth area (premolars, molars) using articulation paper. Premature contacts in the anterior region do not have to be corrected.



21

Remove premature contacts in the posterior tooth area using a ball burr.

22

Tip:
Apply a sealant / remineralization / fluoridation agent to protect areas that were phosphoric acid etched but not covered with bonding material.

3M Unitek Transbond IDB is under evaluation

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Bonding with RelyX™ Unicem 2 and the Incognito™ Clear Precision Tray

Clinical advantages:

- Very transparent tray allows good visual control of seating
- Simple tray removal due to separate hard and soft layer
- Less procedure steps:
  - No metal primer required on brackets or restorations
  - No primer required on tooth surface

If needed clinically, also the Clear Precision Tray can be segmented using a scalpel (inner phase) and scissors (outer layer)

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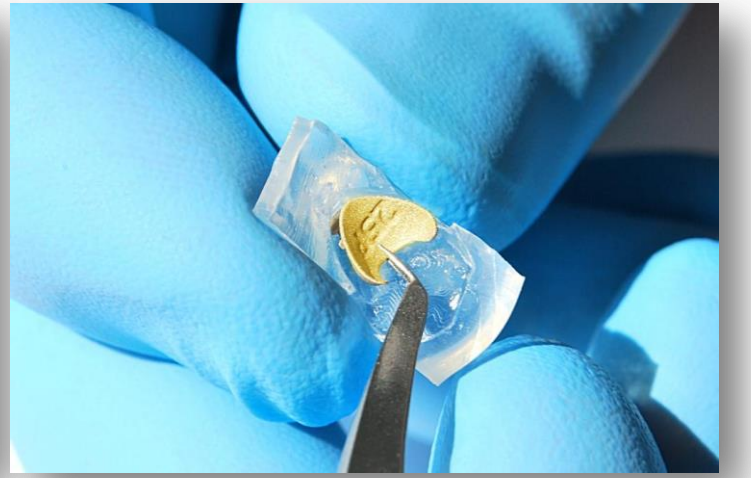
Rebonding with the Clear Precision Tray
Option to create a repositioning jig

Tooth number is indicated in the tray to facilitate orientation

Rebonding with the Incognito Clear Precision Tray
Option to create a repositioning jig



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Rebonding with the Incognito™ Clear Precision Tray

Step by Step

01

Prepare the surface of the tooth. Remove all residual bonding agent using a tungsten carbide finishing burr.

02

Check visually ...

03

... and with probing to ensure that all bonding residue has been removed.

04

Separate the inner soft layer of the bonding tray from the rigid outer layer.

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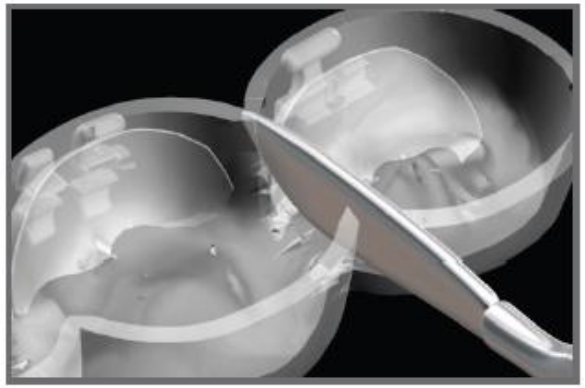
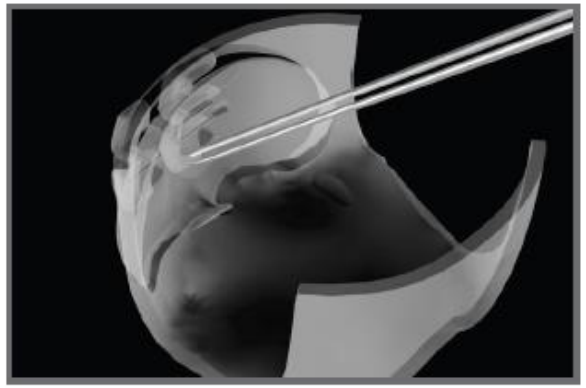
Rebonding with the Repositioning Jig

Step by Step



05

To prepare the repositioning jig, identify the correct tooth cavity in the silicone tray and cut along the interproximal areas mesial and distal of this tooth.

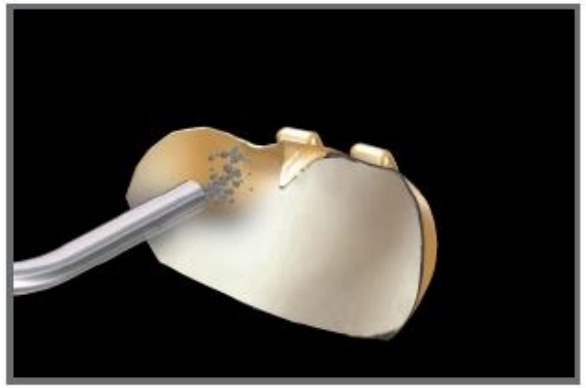


06

Check for, and remove, any loose silicone residue in the bracket cavity.

07

Without the bracket inserted, place the repositioning jig on the tooth and verify the fit.



08

Vertically sandblast the base of the bracket. Completely remove any remaining bonding material and roughen the metal surface.

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Rebonding with the Repositioning Jig

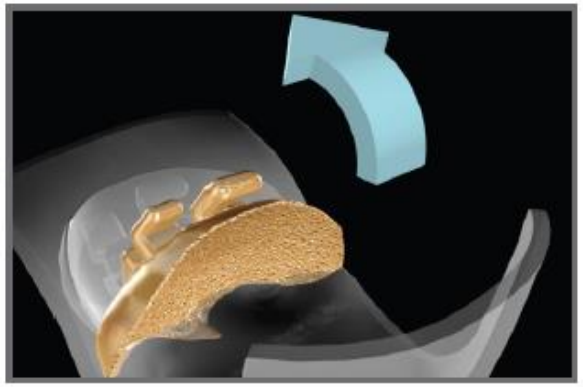
Step by Step

09

Sandblasted bracket base

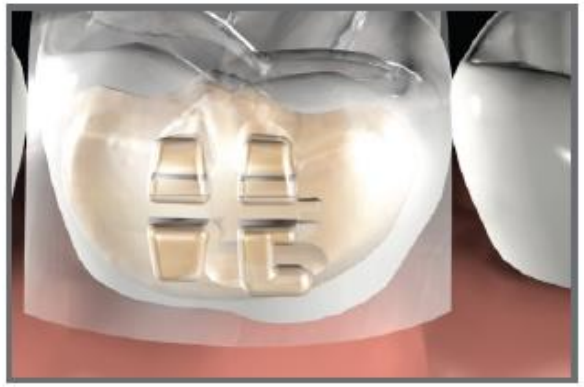
10

Check bracket fit to ensure that surfaces are smooth and the bracket is correctly positioned in the mouth.



11

Insert the sandblasted bracket into the repositioning jig.



12

With the bracket inserted, place the repositioning jig on the tooth and verify the fit again.

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Rebonding with the Repositioning Jig

Step by Step

13

Clean the bracket base with 100% acetone using a cotton pellet.

14

Apply Etching Gel (35% phosphoric acid) and etch for 30 seconds. Refer to screenshot for position, if needed.

15

Remove etchant with suction.

16

Rinse with water.

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Rebonding with the Repositioning Jig

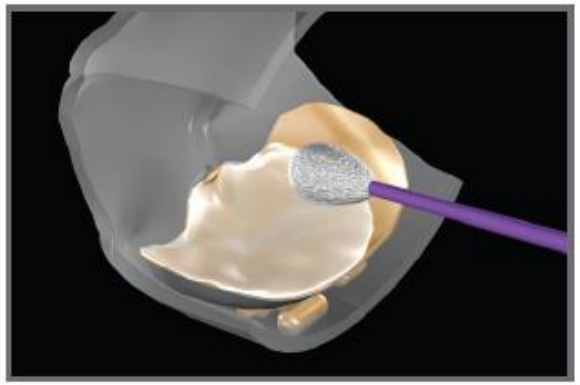
Step by Step

17

Carefully dry using oil- and moisture-free air and recheck the surface of the tooth.

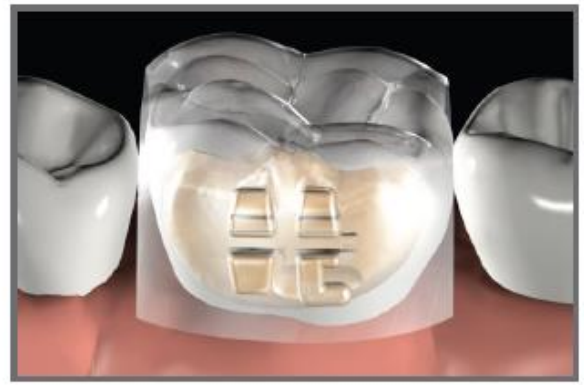
19

RelyX™ Unicem 2 Automix is a dual cure self – adhesive resin cement. The mixing tip facilitates dosing and mixing. Do not cross-contaminate the outlets of the syringe. Please observe the working time of 2 min 30 sec.



20

Using the mixing tip or a micro-brush, apply a thin, even layer of bonding material directly to the bracket base in the repositioning jig. Control the amount of bonding material used. Too small amounts may result in gaps under the bracket base. Too large amounts will create excessive flash.



21

Seat the repositioning jig with the bracket inserted.

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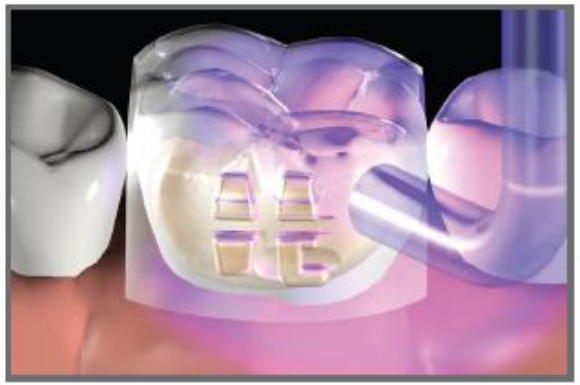
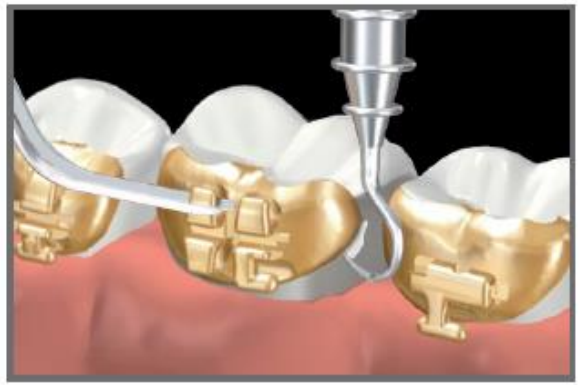
Rebonding with the Repositioning Jig

Step by Step



22

Hold the light guide as close as possible, curing for 3 seconds (total 12 sec. cure) on all four sides of the bracket using the Ortholux™ Luminous Curing Light. *

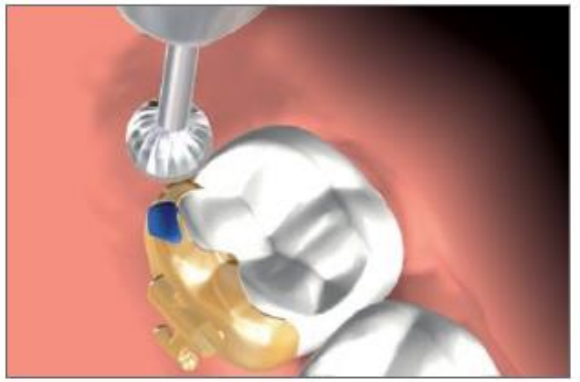


23

Remove the repositioning jig and carefully remove any excess bonding material using a scaler or a slow speed finishing burr if necessary.

24

Check occlusion.



25

Any premature contacts with the bracket base in the lateral tooth area must be removed with the ball burr.

* Curing time depends on power of your curing light. With less power, the required curing time increases. Refer to manufacturer's instructions.

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Presentation Overview

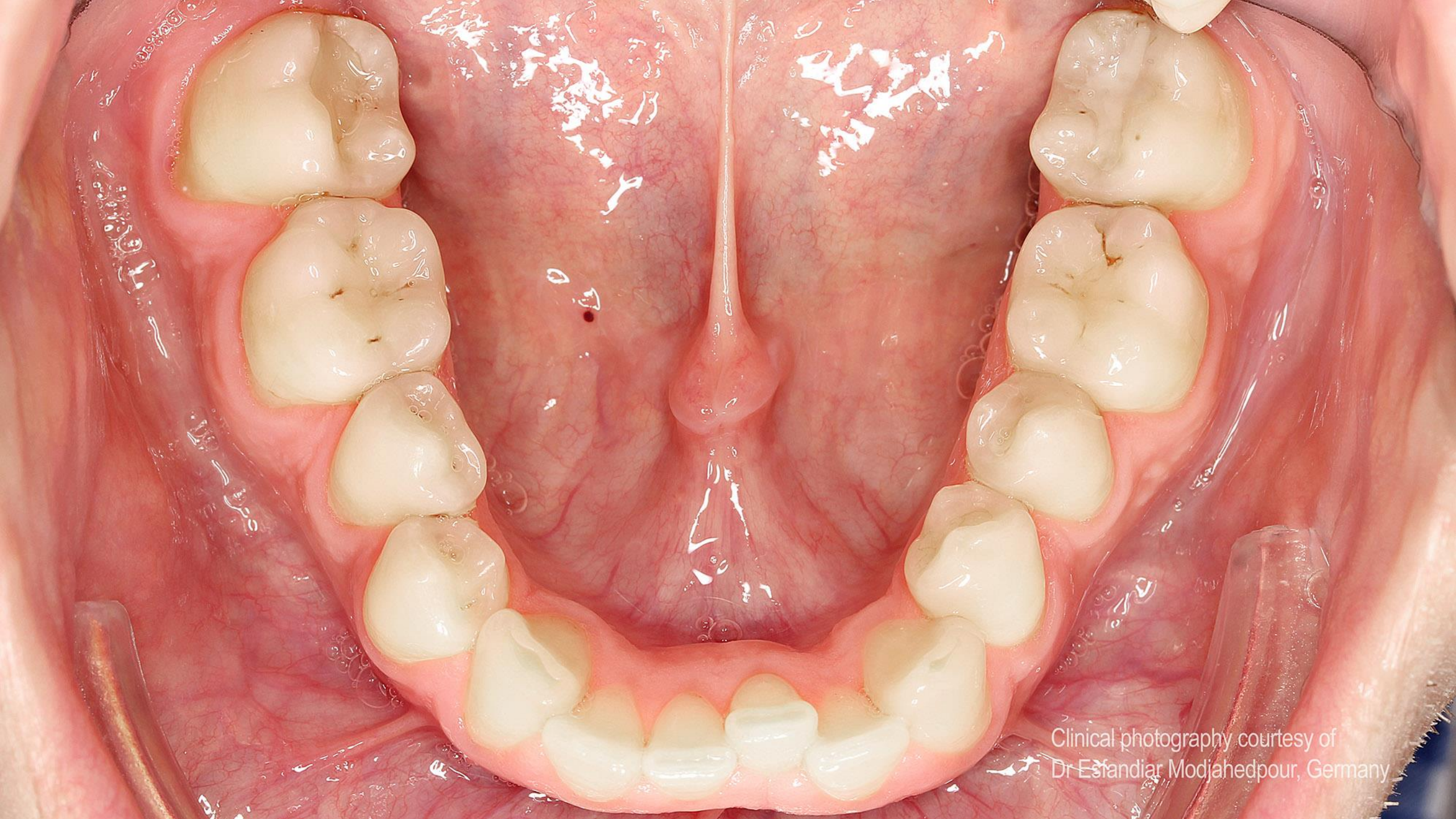
- Incognito™ System Digital Workflow
- The Incognito Clear Precision Tray
- Manufacturing the Clear Precision Tray
- Research Results
- Bonding with the Clear Precision Tray
- **The Incognito Clear Precision Tray in Clinical Use**
- How to order

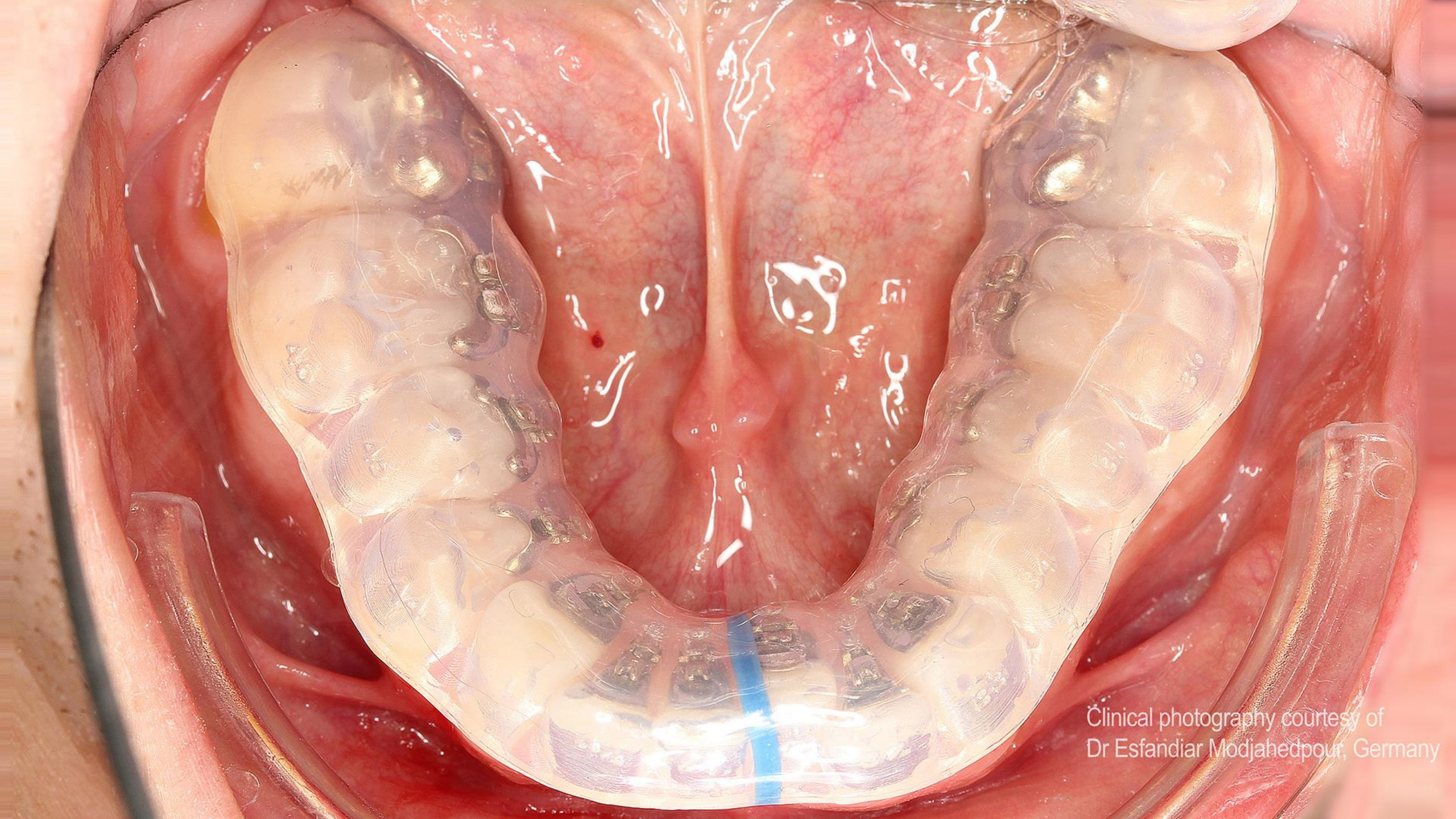
Incognito™ Clear Precision Tray in Clinical Use

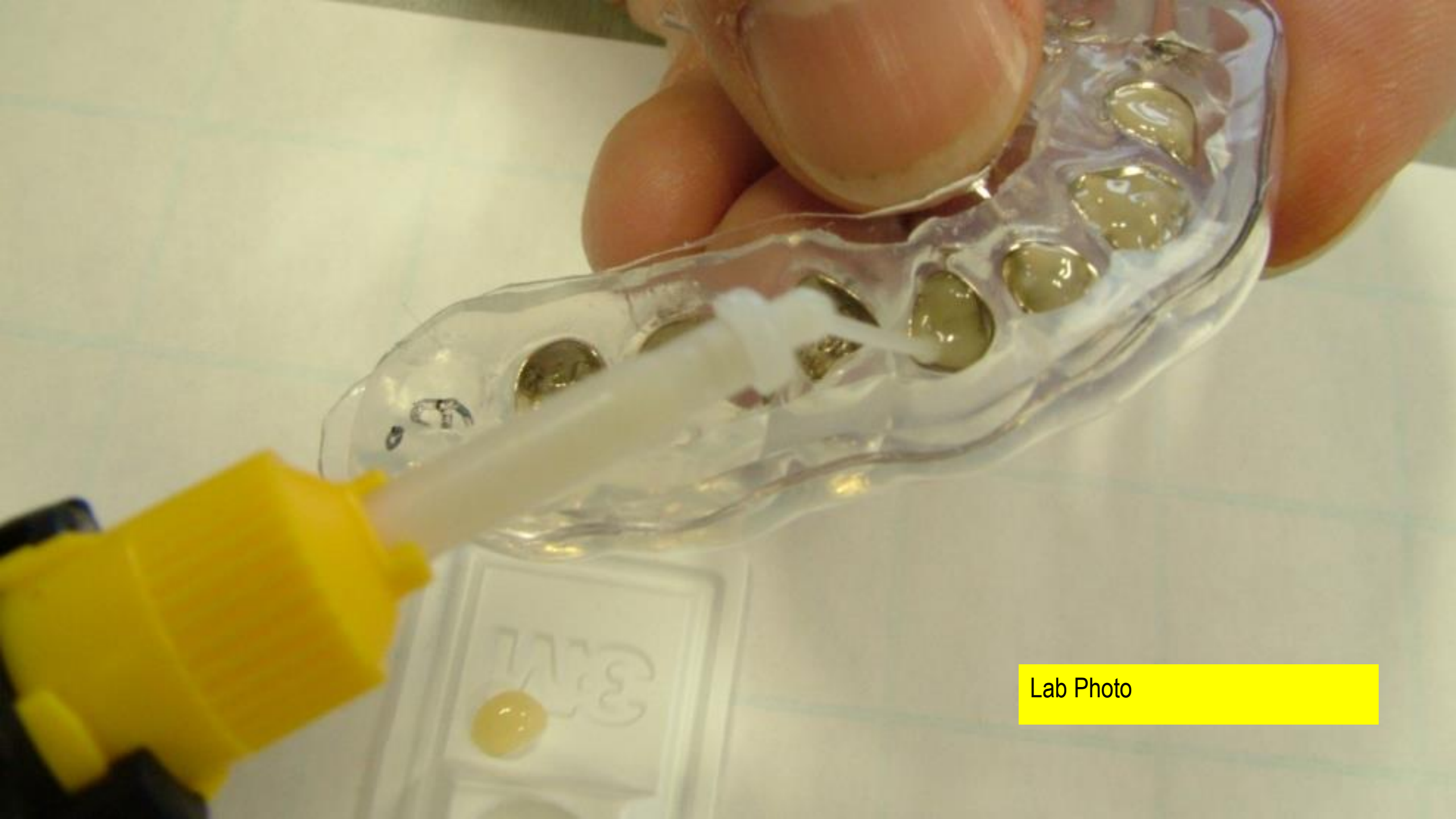
Clinical case

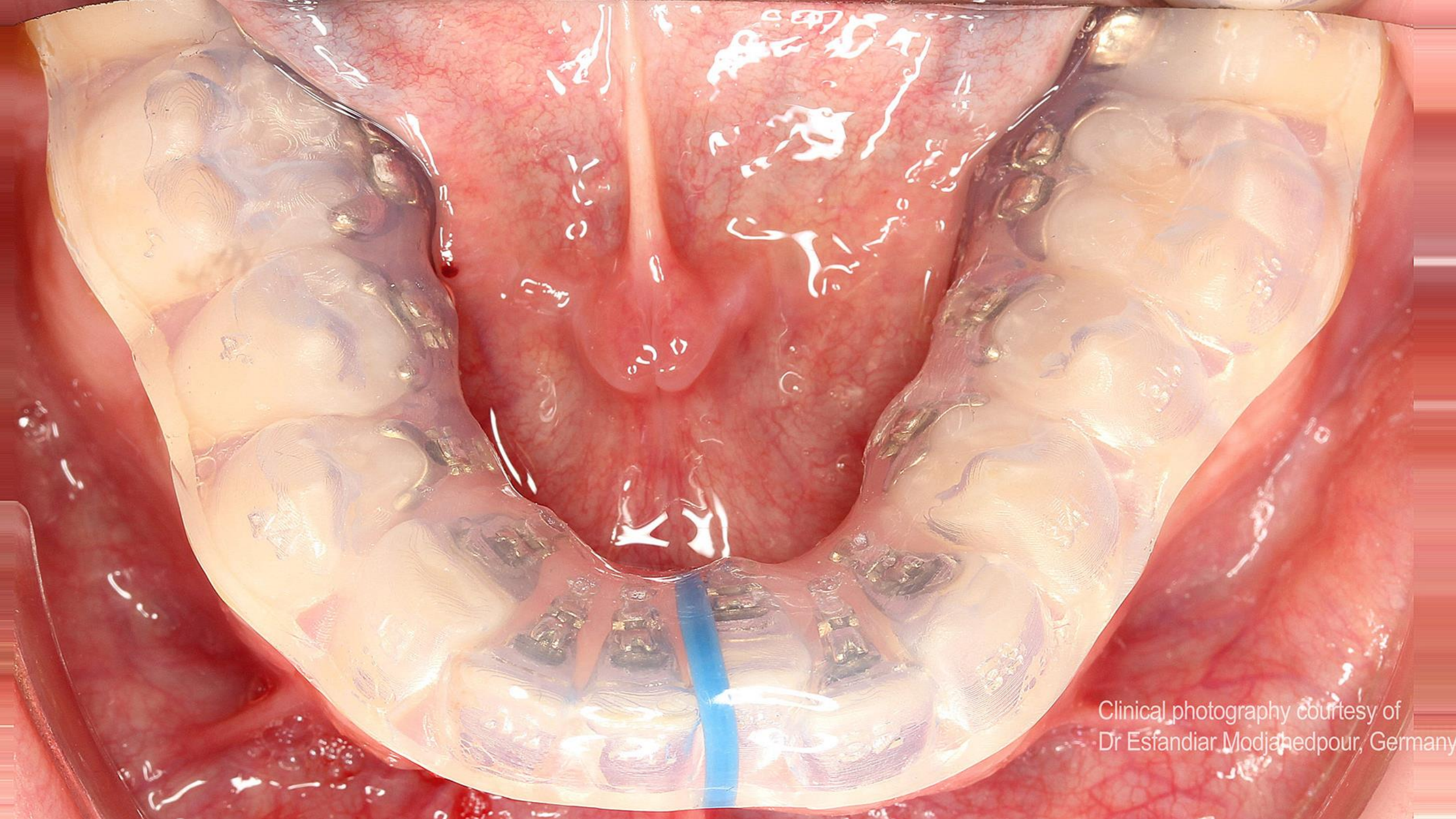
Bonding of a lower arch 7 – 7 using the Incognito Clear Precision Tray and RelyX™ Unicem 2 Automix

The maxilla is bonded with the conventional double silicone tray.


Clinical photography courtesy of
Dr Esfandiar Modjahedpour, Germany


Clinical photography courtesy of
Dr Esfandiar Modjahedpour, Germany

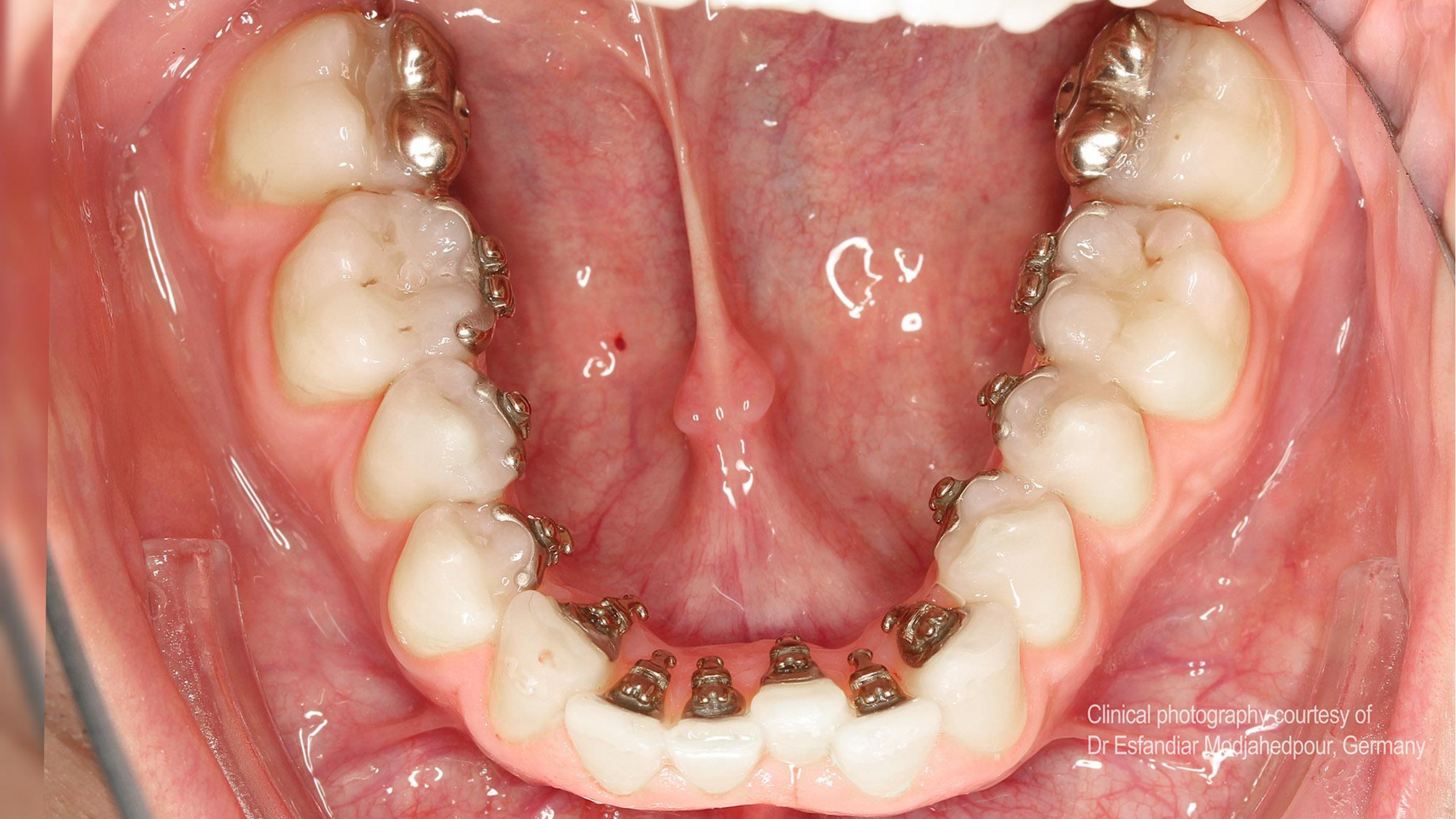

Lab Photo


Clinical photography courtesy of
Dr Esfandiar Modjahedpour, Germany

Clinical photography courtesy of
Dr Esfandiar Modjahedpour, Germany


42
Clinical photography courtesy of
Dr Esfandiar Modjahedpour, Germany

Clinical photography courtesy of
Dr Esfandiar Modjahedpour, Germany


Clinical photography courtesy of
Dr Esfandiar Modjahedpour, Germany

Incognito™ Clear Precision Tray in Clinical Use

Clinical acceptance evaluation with

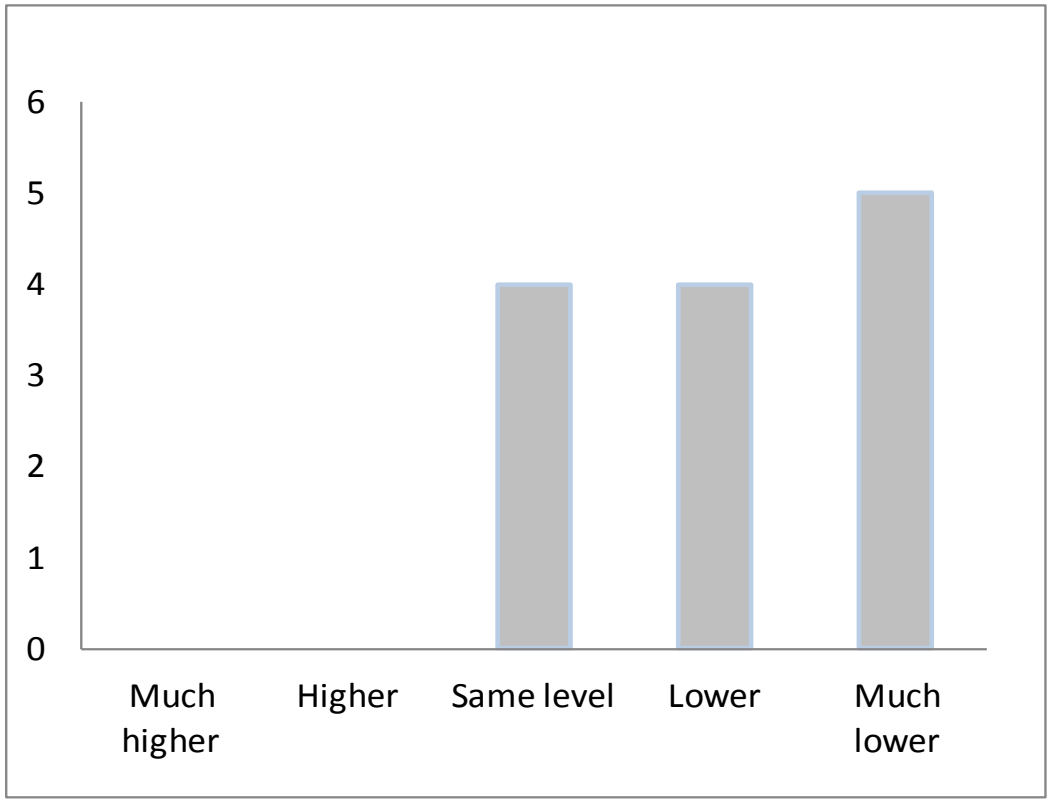
- 16 orthodontists from 12 countries
- Users of all current tray types
- Experienced and new users of RelyX™ Unicem2 Automix
- Approximately 200 Incognito Clear Precision Trays bonded

100% of the testers would recommend the new tray to their colleagues and continue to order it for their own cases

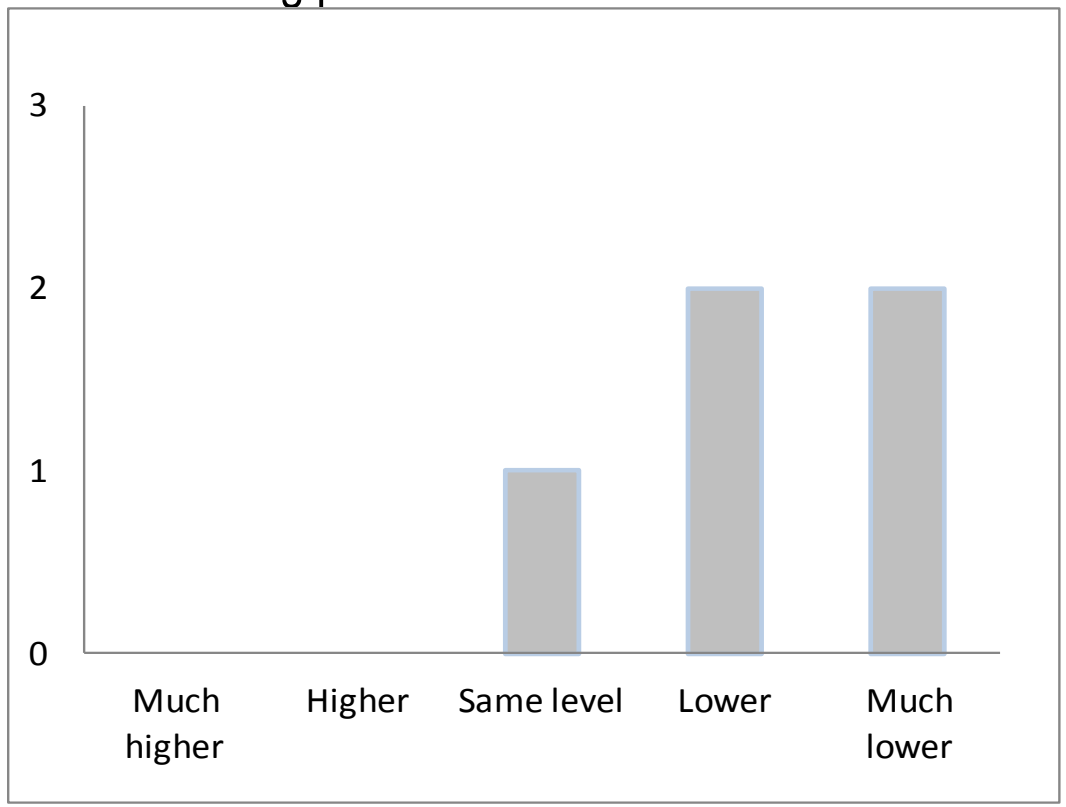
Incognito™ Clear Precision Tray in Clinical Use

Low bond failure rate

How does the number of *initial* bond failures compare to failures with your current bonding process?



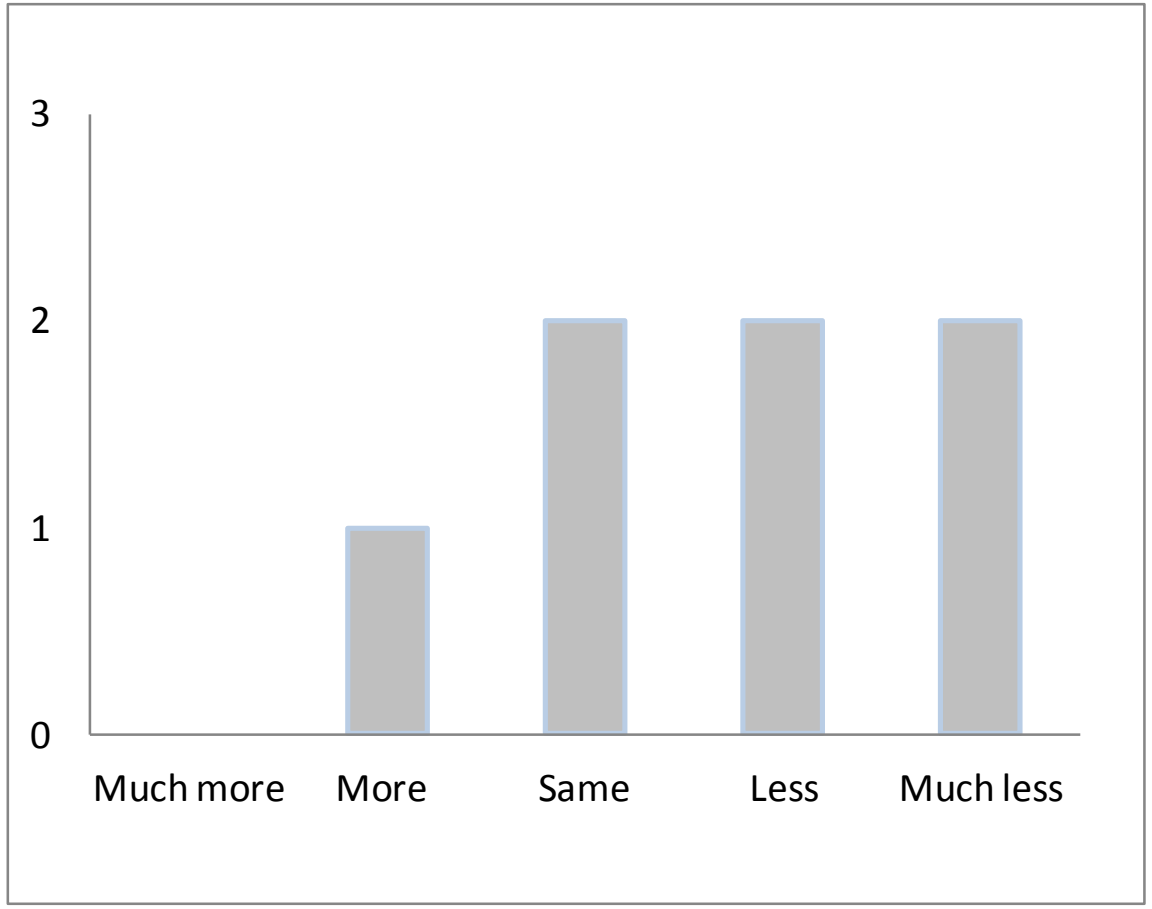
How does the number of *in-treatment* (2-3 month) bond failures compare to failures with your current bonding process?



Incognito™ Clear Precision Tray in Clinical Use

Controlling excess resin

How much excess resin did you observe compared to bonding with the tray type you used in the last 12 months?



Methods used to control excess resin during evaluation:

- Training to apply the optimum amount
- Dental probe
- Scaler
- Rotating instrument

Presentation Overview

- Incognito™ System Digital Workflow
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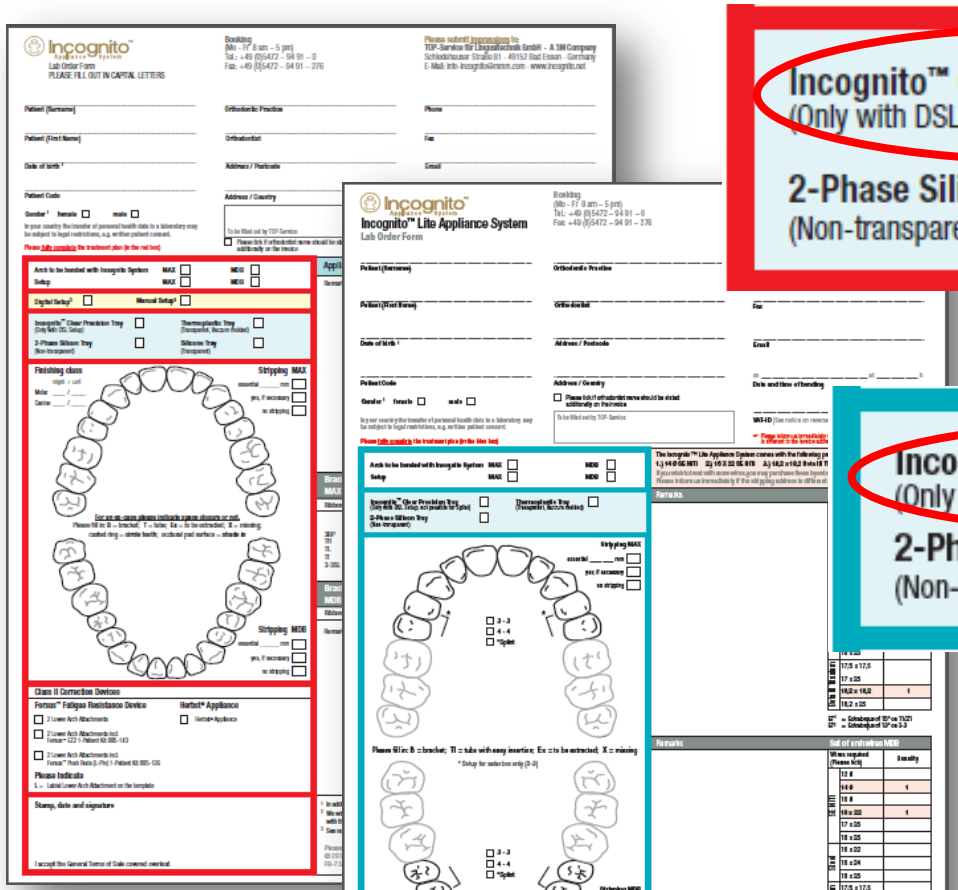
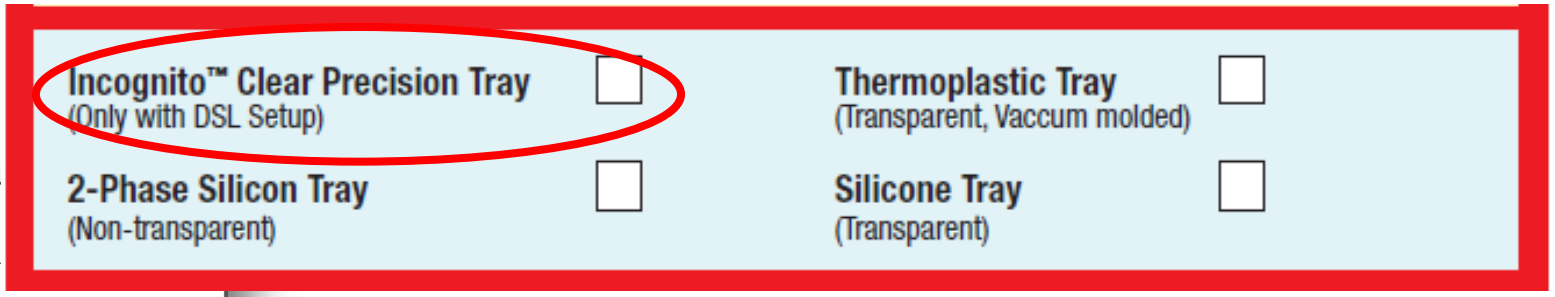
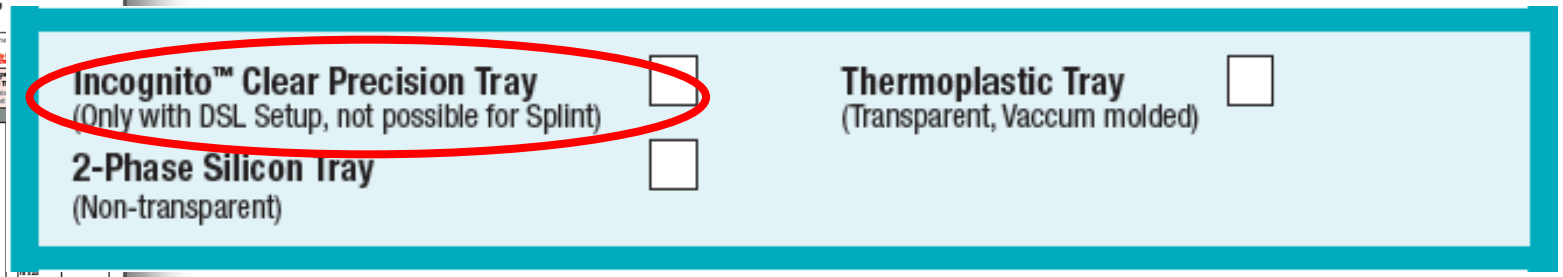
- **How to order**

How to order the Incognito™ Clear Precision Tray

- Lab Order Form







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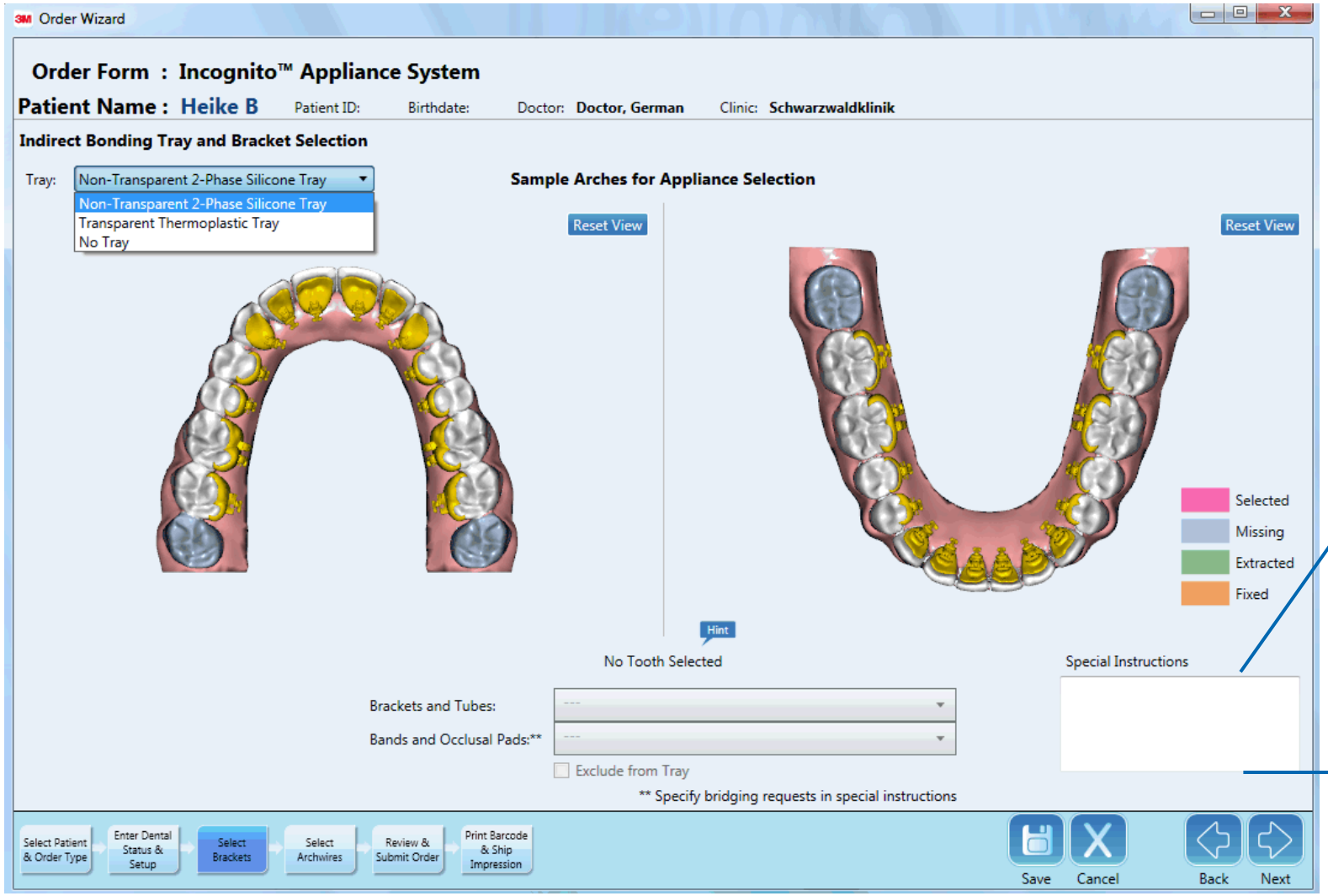
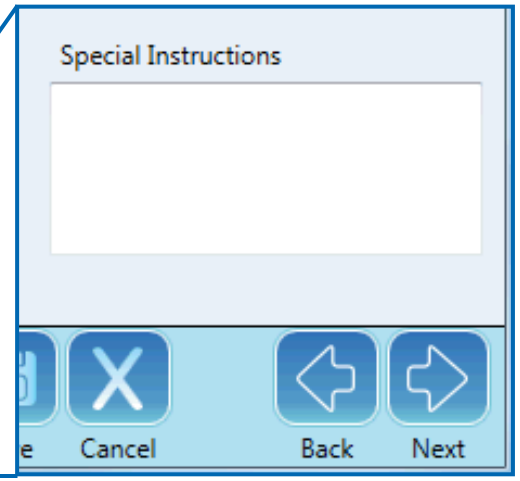
How to order the Incognito™ Clear Precision Tray



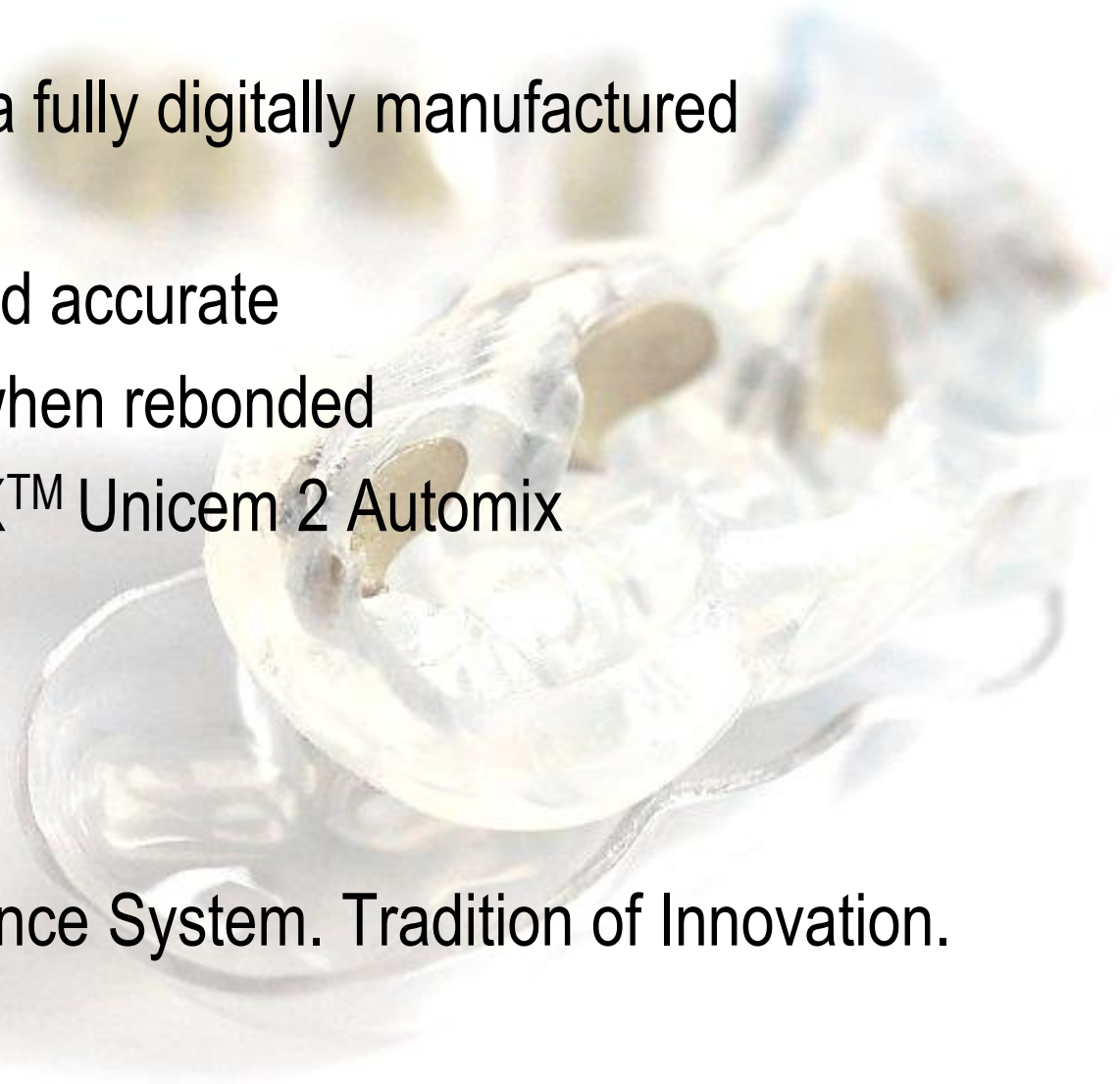
TMP:

Please indicate “Clear Precision Tray” in the special instructions section until further notice



Incognito™ Clear Precision Tray Summary

- With the Clear Precision Tray you receive a fully digitally manufactured Incognito Case
- Bracket positioning is extremely precise and accurate
- Precision and accuracy remain the same when rebonded
- Bonding and Rebonding with proven RelyX™ Unicem 2 Automix
- Less steps in bonding procedure
- Rebonding jig for safe placement



Incognito Appliance System. Tradition of Innovation.

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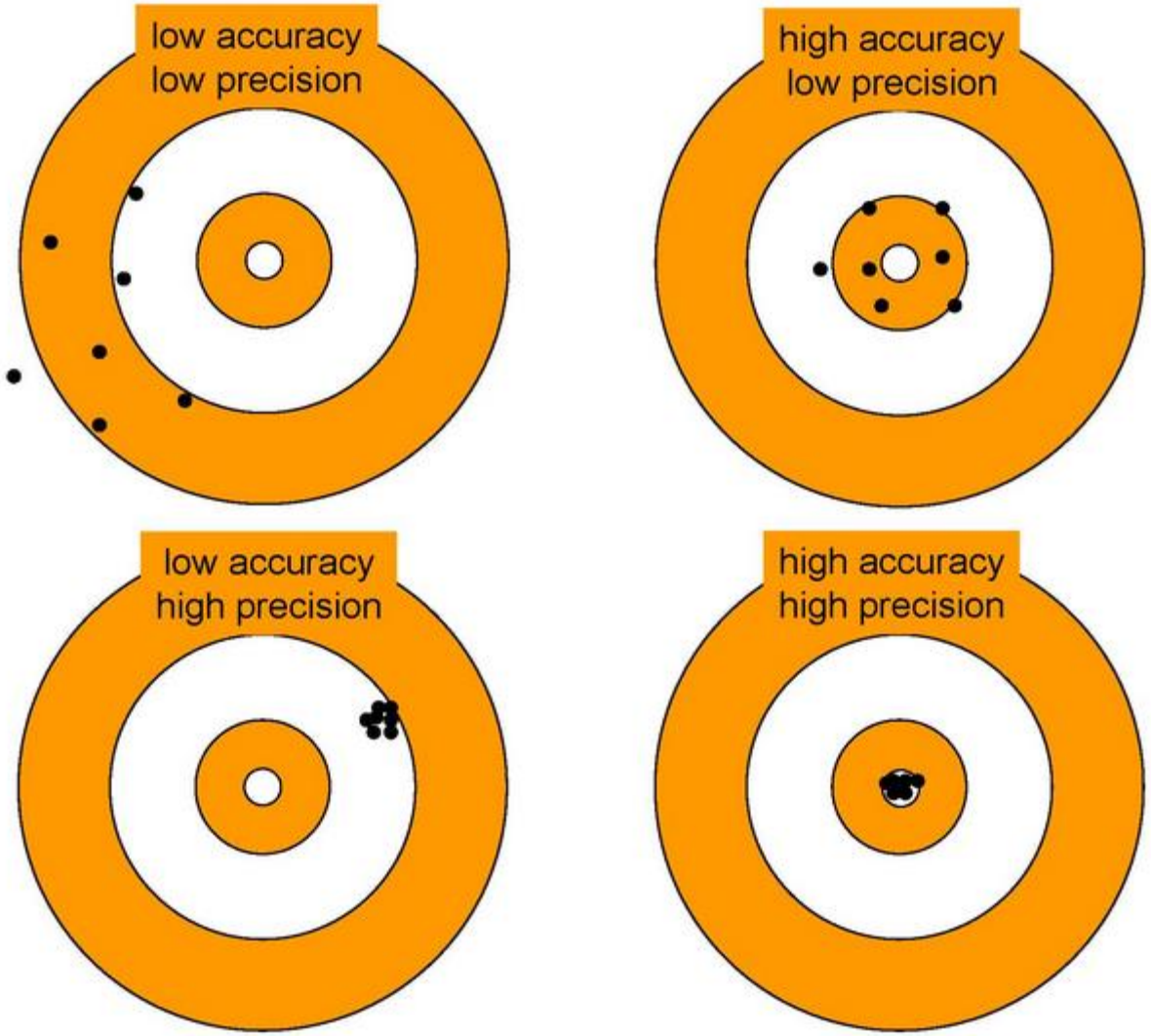
Thank you for your attention

Appendix

Accuracy vs. Precision



http://dl.clackamas.cc.or.us/ch104-01/accuracy_vs_precision.htm

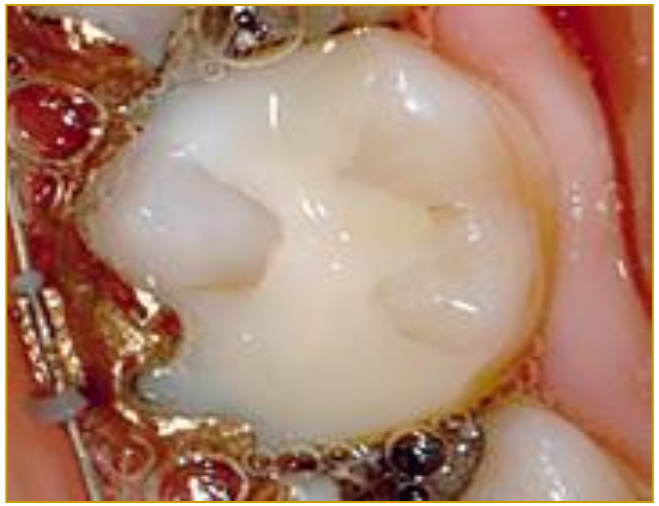
Bonding to Metal with RelyX™ Unicem 2

1. Roughen or microetch/sandblast metal for 4 sec
2. Rinse off and dry
3. Bond with RelyX Unicem 2

If using other adhesives: apply metal primer, e.g. Reliance

Bonding to Composite with RelyX™ Unicem 2

1. Roughen the composite surface (finishing burr or sandblasting)
2. Rinse off and dry
3. Bond with RelyX Unicem



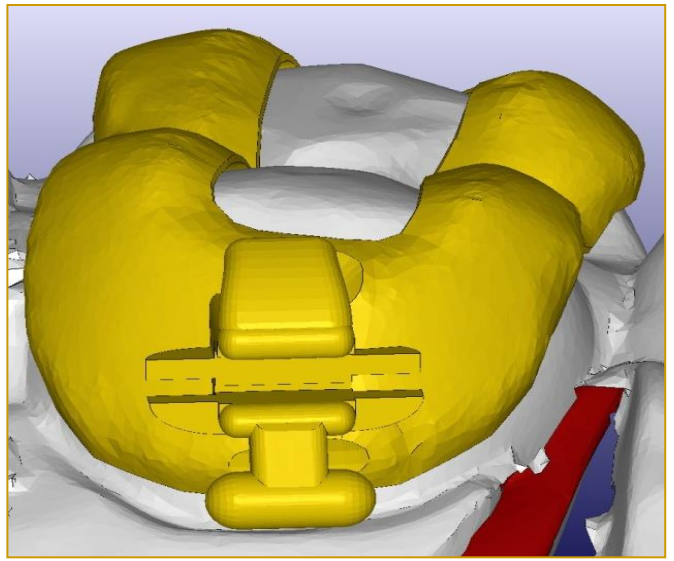
Bonding to Porcelain (same for all adhesives)

- OPTION A: Order a ring/band instead of bracket to increase retention surface

- OPTION B: Use porcelain etch to increase retention for etchable ceramics (feldspathic veneers, leucite reinforced & lithium disilicate ceramic)

Bonding to Porcelain

OPTION A: Order a ring/band instead of bracket to increase retention surface



- Carefully roughen surface (micro-etch ≤ 50µm)
- Use your adhesive of choice

Bonding to Porcelain*

OPTION B

- Porcelain Etching Agent
  - Porc-Etch™ (Reliance)
- Porcelain Conditioner (Reliance)

Caution! Porc-Etch™ contains hydrofluoric acid (toxic, acidic).
Do not allow contact to gingival tissue

* veneering porcelain, leucite reinforced or lithium disilicate full ceramic restorations

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Bonding Procedure for Porcelain Crowns (Option B)

- Micro-etch crown with ≤ 50 micron aluminum oxide crystals
- Rinse thoroughly, isolate and dry tooth
- Place the barrier gel around the gingivia margin for protection
- Place porcelain etch on the crown for a total of 4 minutes

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Bonding Procedure for Porcelain Crowns (Option B)

- Wipe porcelain etch off tooth with cotton pellets, keep away from soft tissue
- Rinse with air/water syringe thoroughly and dry
- Apply silane (e.g. Porcelain Conditioner or RelyX™ Ceramic Primer) and allow to dry for 1 minute, then keep free from contamination
- Bond as usual

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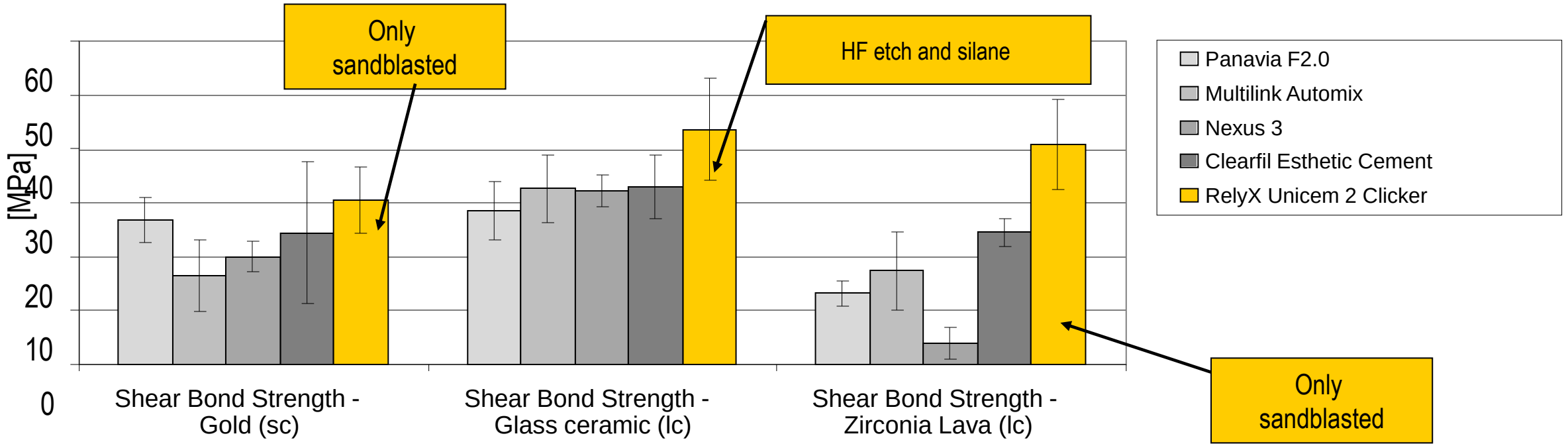
RelyX™ Unicem 2 – adhesion to restoration materials

Excellent bond strength to gold and porcelain AND zirconia even after artificial aging

– better than some multi-step resin cements



Shear bond strength after 5000 thermocycles.

Restoration materials were pretreated as recommended by the respective manufacturer.

Source: 3M ESPE internal data