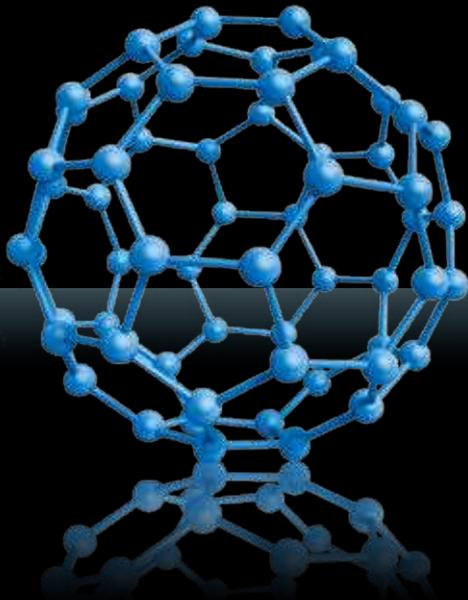


ADHESIVES

Latest generation bonding agents
for easy, rapid and reliable use

*Innovative technologies for
optimal bond strength*



Bonding agents that cope with any challenge

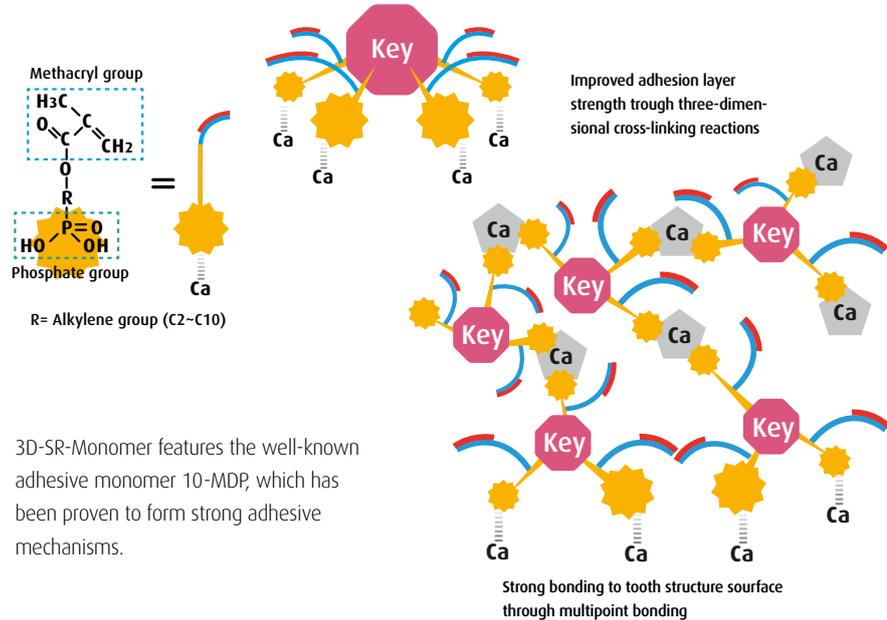
- + Extremely high bond strength
- + Perfect quality marginal integrity
- + No postoperative sensitivity
- + Short treatment time due to easy handling
- + Universal field of applications

KEY TECHNOLOGY

The 3D-SR-Monomer – a self-reinforcing adhesive monomer

The 3D-SR-Monomer

The extraordinary adhesive strength of TOKUYAMA's adhesive systems is based on a technologically unique monomer, which has been modified and optimized in the 2nd and 3rd generation, so that additional reaction chains of different lengths on the molecule form various multiple bonds and produce an extremely tough and tear-resistant adhesive layer in a very short time. Through numerous chemical and mechanical bonds to the apatite of the tooth surface and the calcium ions of the tooth substance, the self-reinforcing monomer creates a 3-dimensional matrix. In addition, the latest generation of the

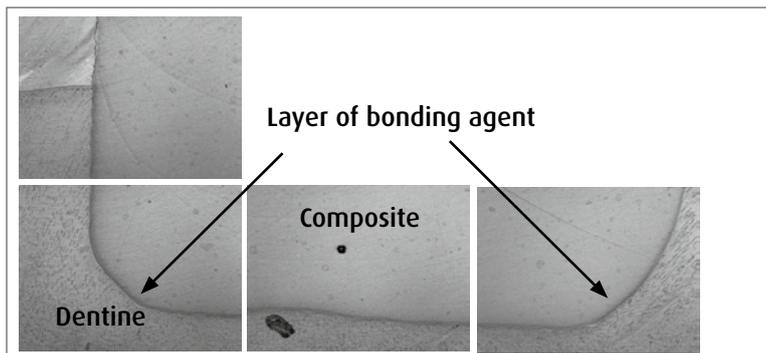


3D-SR-Monomer features the well-known adhesive monomer 10-MDP, which has been proven to form strong adhesive mechanisms.

Thin uniform film thickness

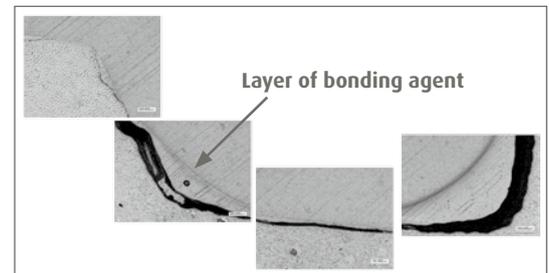
Due to low viscosity, the gel-like bubble-free layer of TOKUYAMA adhesives is evenly distributed even in stepped cavities. There are no so-called "dry spots" despite minimal film thickness. Light-curing creates further bonds.

A "3-dimensional matrix" is created which forms a robust tear-resistant adhesive layer. Handling is extremely quick and easy, further ensuring excellent results.

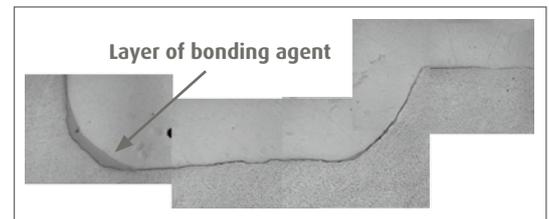


BOND FORCE II (TOKUYAMA DENTAL)

Formation of the bonding layer



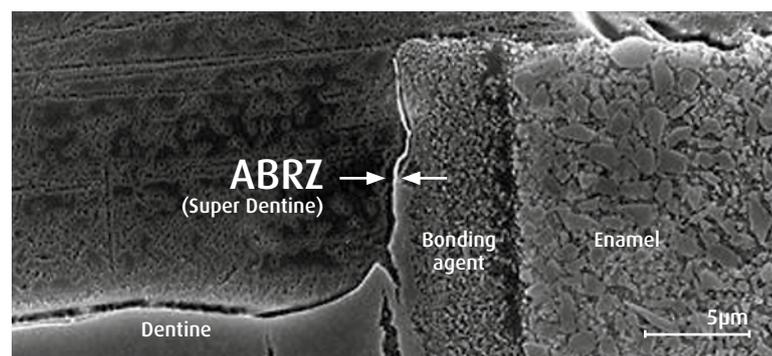
Xeno V (Dentsply)



Scotchbond Universal Adhesive (3M Espe) Source: TOKUYAMA DENTAL R&D

Super Dentine

"Super dentine", which is resistant to acid or base attacks, is formed by the reaction of our unique 3D-SR-Monomer and adjacent dentine. Thus tooth are protected against secondary caries.



Source: Nikaido, et al., Tokio Medical and Dental University, 2007

EE-BOND & ETCHING GEL HV

The special bonding system
for selective enamel etching

Optimised etching gel



TOKUYAMA ETCHING GEL HV was specially developed for pin-point enamel etching, due to its extra-fine tips.

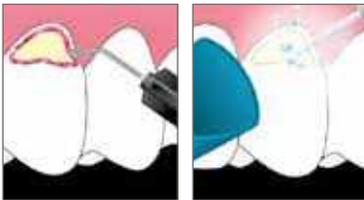


TOKUYAMA ETCHING GEL HV can be applied exactly to the right area of enamel.



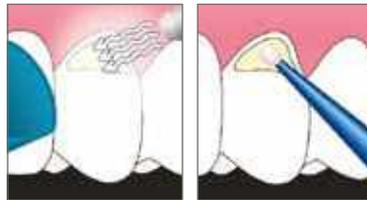
The gel is clearly visible and easy to rinse off.

Etching and irrigation 10 sec.



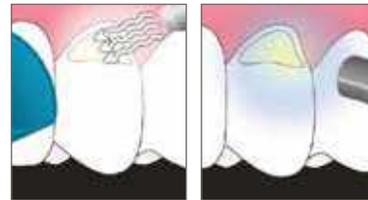
Apply ETCHING GEL HV and rinse off

Air-drying and bonding >10 sec.



Air-dry and apply EE-BOND

Air-drying and light-curing 20 sec.



First air-dry and then light-cure

Reliable use

Just apply ETCHING GEL HV to the unprepared enamel margin and rinse it off after 5 seconds.

Easy to use

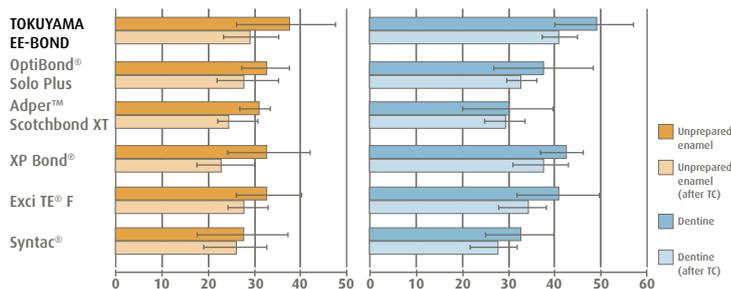
After briefly drying the cavity, apply EE-BOND to enamel and dentine only. Let it take effect for 10 seconds without rubbing in.

Optimal result

After 10 seconds air-drying and 10 seconds light-curing, EE-BOND with ETCHING GEL HV ensures optimal adhesion to both enamel and dentine.

Excellent adhesion to both enamel and dentine

Since ETCHING GEL HV and EE-BOND are balanced with each other, this new bonding system ensures a higher than every bond strength compared with conventional total-etch products. Also, because of pin-point accuracy etching, dentine is conserved and gently sealed making postoperative sensitivity a thing of the past.

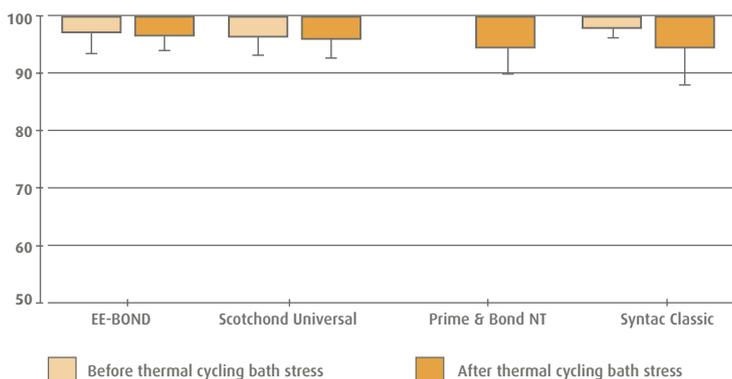


Micro tensile strength before and after thermal cycling test [MPa]

Source: TOKUYAMA DENTAL R&D

Independent studies also confirm the outstanding properties of the EE-BOND bonding system.

Quotation: "From this in vitro study it is possible to conclude that, in the case of standardised class V restorations, the tested self-etching adhesive EE-BOND, in conjunction with selective enamel etching using phosphoric acid, ensures effective marginal integrity, both on the enamel and on the dentine".

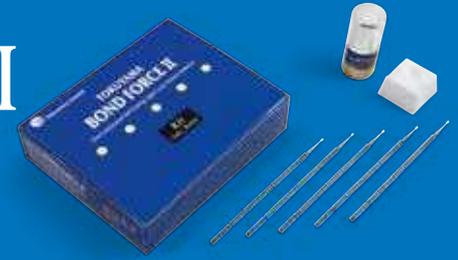


Number of marginal qualities "continuous margin" in the enamel before and after thermal cycling bath stress

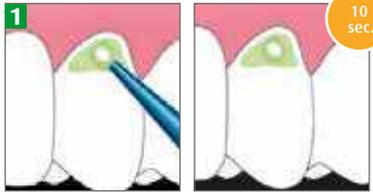
Source: Dr. Blunck, Charite Berlin

BOND FORCE II

Light-cured self-etching
single-component adhesive

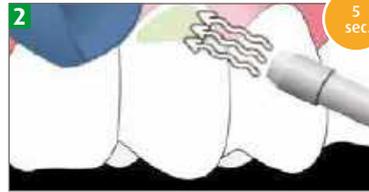


Easy to use



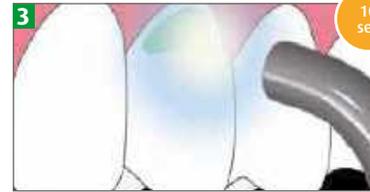
Simply apply one drop of BOND FORCE II to the cavity.

Reliable use



Dry for only 5 seconds before curing.

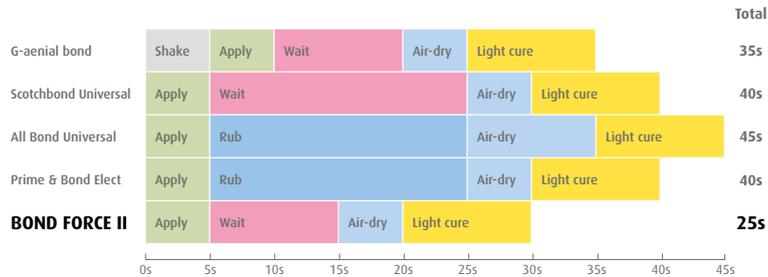
Optimal result



After 10 seconds of light curing BOND FORCE II ensures optimal results with minimum efforts.

Ultra rapid use - Storage stable

The new BOND FORCE II reduces the duration of application for the dentist and the patient. The entire application is completed within just 25 seconds – simple, fast and safe. This minimizes the risk of application errors. And what is more, BOND FORCE II has extremely high storage stability so storing in the fridge is not necessary.

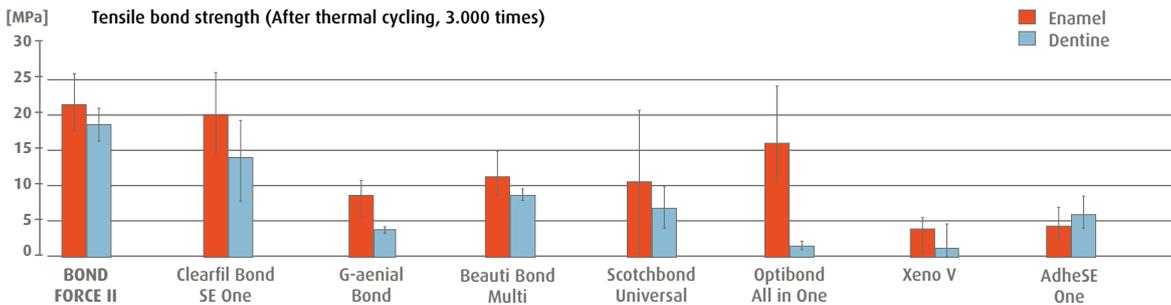


Superior adhesive strength

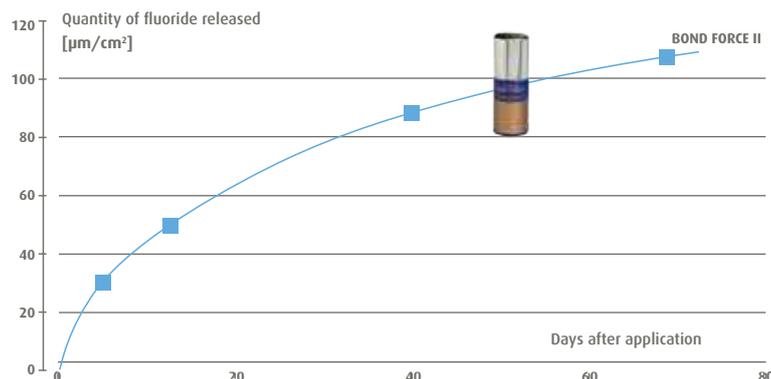
Despite its reduced application time, the multiple bonds of the 3D-SR-Monomer form an extremely stable adhesive layer,

so BOND FORCE II boasts outstanding adhesive strength values, both to enamel as well as to dentine – especially after

thermocycle loading – which makes it the mean of choice when it comes to simple, but reliable adhesion.



High fluoride release

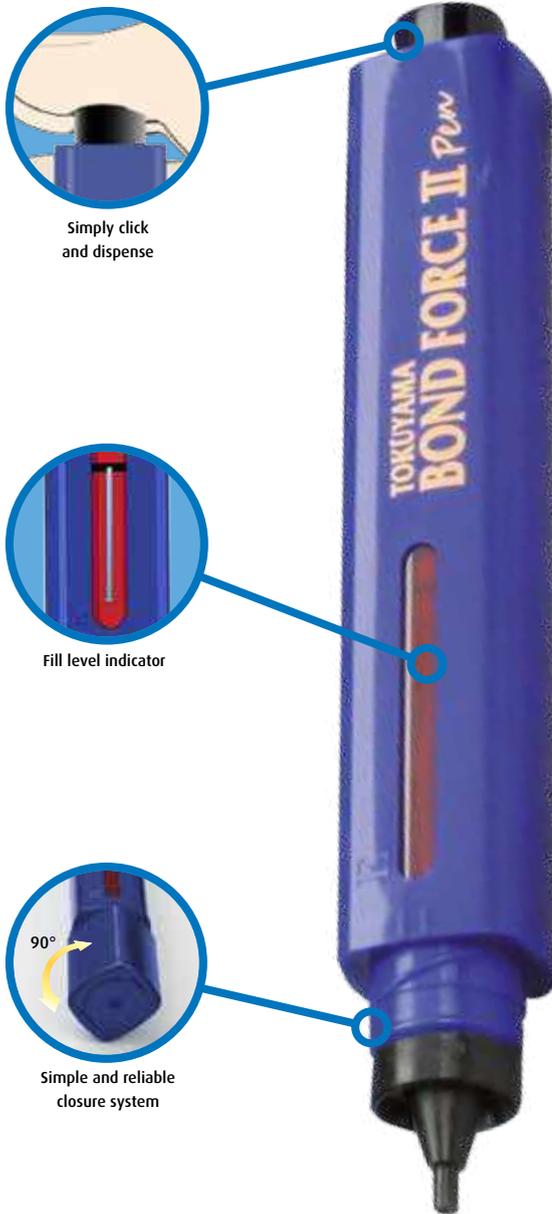


TOKUYAMA BOND FORCE II releases fluoride continuously and effectively protects the treated cavity against secondary caries. BOND FORCE II in particular is characterised by a very high level of fluoride release.

Source: TOKUYAMA DENTAL R&D

BOND FORCE II PEN

Best dispensing system combined with the best properties of BOND FORCE II



BENEFIT 1

Ballpoint pen

The innovative BOND FORCE II *PEN* dispenser is used just like a ballpoint pen. 2 clicks are sufficient to dispense just the right amount in an easy and hygienic manner.

BENEFIT 2

Safe'n Easy system

The BOND FORCE II *PEN* can be easily opened and reliably closed by twisting the cap through 90°. A fill level indicator shows how much material has been used. It incorporates a guideline to show when there is less than 60% left.

BENEFIT 3

Application quantity

The BOND FORCE II *PEN* always dispenses exactly the same size drops – sparingly and optimally. Waste is thus avoided, making the material extremely economical to use.

Amount required

Source: TOKUYAMA DENTAL R&D

	BOND FORCE II	BOND FORCE II	AdheSE one F	Xeno V	i-Bond SE	Optibond Solo Plus
Bonding agent						
	TOKUYAMA	TOKUYAMA	Ivoclar Vivadent	Dentsply	Heraeus Kulzer	Kerr
Application	Pen	Bottle	Pen	Bottle	Bottle	Bottle
mg / drop	10.1 mg	15.0 mg	16.7 mg	22.0 mg	27.2 mg	25.1 mg
Drops / ml	99	67	60	47	34	42

UNIVERSAL BOND

Contact curing, two-component universal adhesive



When is a bonding a universal one?

Definition of Universal Bond – THE DENTAL ADVISOR Vol. 30, No. 02 March 2013

1 Compatibility with different etching techniques: total-, self-, or selective-etch

2 Compatibility with dual- and self-cure materials but without the use of a separate activator

3 Can be used as a primer for ceramic, zirconia or metal-based restorations

Few universal adhesive systems are as universal as one would expect. Often, the supposedly universal field of application extends only to the possibility of following different etching protocols. If the adhesive system is to be used beyond this, in many cases an additional activator is required or the bonding cannot be used as a primer for pretreatment of repairs.

Manufacture	TOKUYAMA DENTAL	3M ESPE	GC	Kuraray Noritake Dental	Dentsply	Ivoclar Vivadent	Heraeus Kulzer
Product ALL PROCEDURES	TOKUYAMA UNIVERSAL BOND	Scotchbond UNIVERSAL BOND	G-Premio BOND	Clearfil Universal Bond	Prime & Bond Elect	Adhese Universal	iBond Universal
Total-/Self-/Selektive etch	✓	✓	✓	✓	✓	✓	✓
Compatible with all light-curing, dual-curing or self curing composites	✓	▲ *1	● *2	▲ *3	▲ *4	✓	✓
Primer for prosthesis	✓	▲ *1	● *2	▲ *3	● *4	●	●

*1: Activator required if not used in combination with Rely X Ultimate
 *2: Bonding of core build-up materials only with light curing
 *3: Activator and light curing required if not used in combination with DC Core Plus or Panavia SA
 *4: Activator required
 Source: TOKUYAMA DENTAL R&D

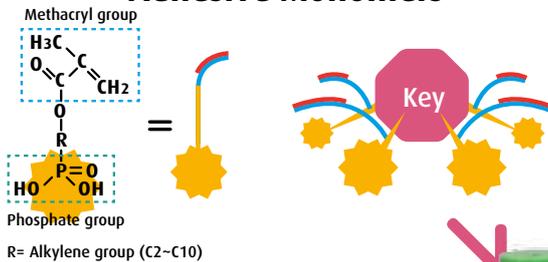
Universal adhesion mechanism

In addition to the new 3D SR Monomer, which is also responsible for the adhesion to zirconium, TOKUYAMA UNIVERSAL BOND contains further special bonding components for non-precious metals, precious metals and glass or oxide ceramics, so that a reliable bond can be produced on all prosthetic surfaces. A key role is played by the new silane bonding agent γ -MPTES, which ensures

that even on glass-ceramic surfaces a secure bond is created without previous hydrofluoric acid etching. Studies by the renowned Belgian University of Leuven suggest that the silane bonding agent in one-bottle-systems is rapidly degraded by the acidic components. (Effectiveness and stability of silane coupling agent incorporated in "universal" adhesives, van Meerbeek et. al.).

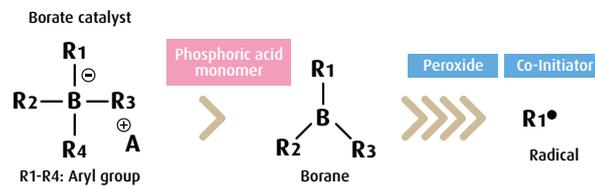
In such cases, a reliable bond cannot be achieved without fresh silane. TOKUYAMA UNIVERSAL BOND separates the acid components and the silane coupling agent to ensure that fresh silane is always present and that the bond succeeds reliably.

Adhesive Monomers



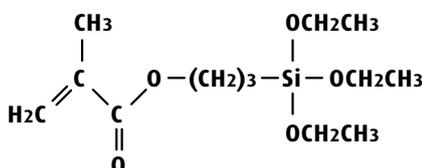
3D SR Monomer provides chemical bonding to tooth, zirconia, alumina and non-precious metal.

Polymerisation Catalyst

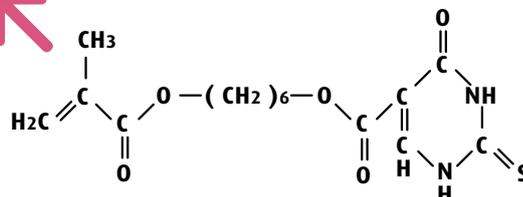


BoSE technology exhibits high catalytic activity under acidic conditions. A thin bonding layer formed after air blow becomes hard because of rapid progression of polymerization and curing an its adhesive interface (Contact Cure), when it comes into contact with resin materials.

γ -MPTES reacts with glass ceramic surface.



MTU-6 interacts with precious metal



Source: TOKUYAMA DENTAL R&D

UNIVERSAL BOND

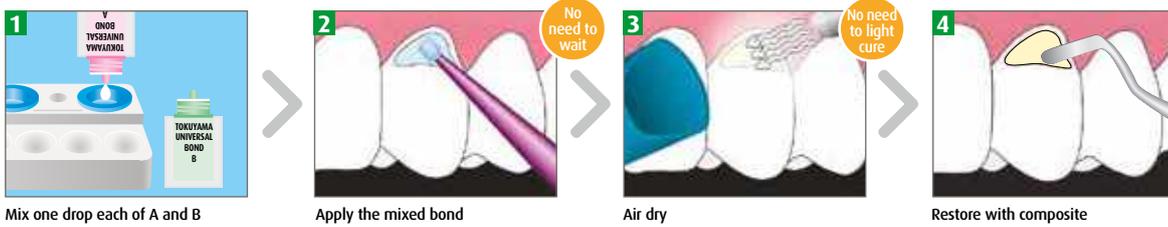
Contact curing, two-component universal adhesive

Clinical use

Regardless of whether you want to make a direct or indirect restoration, the adhesive bond always succeeds easily and in the same way: mix the liquids 1:1,

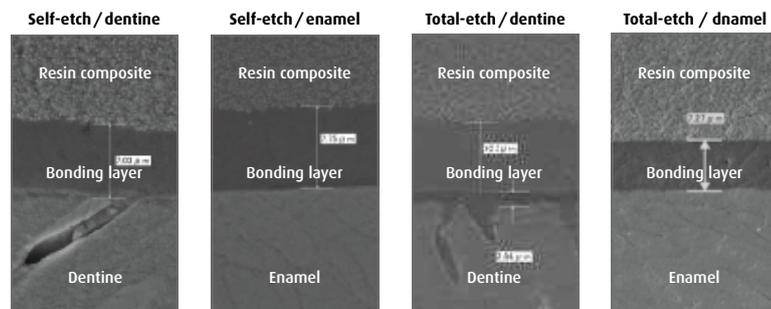
apply, blow, done. Due to the strong cross-linking reactions, no reaction time is required and the use of the new BoSE catalyst has also made

light curing obsolete. A simple, fast and standardised procedure for every surface.

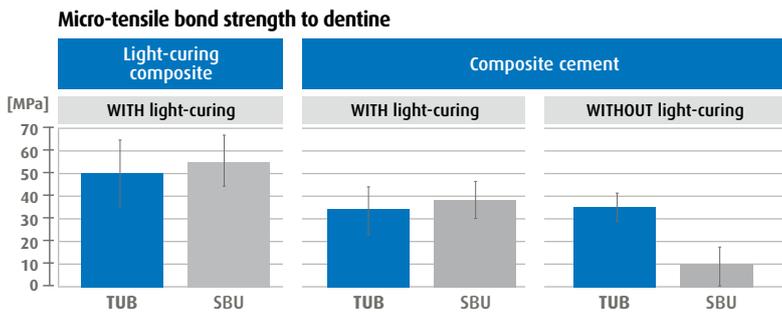


All etching techniques

Scanning electron microscope images clearly show the excellent bond of TOKUYAMA UNIVERSAL BOND to both dentine and enamel, regardless of the etching protocol used. In all cases, a uniformly thin and highly resistant adhesive layer is formed, which is ideally suited for aesthetic restorations.



Compatibility with all composite materials



Extract of the study:

„The dark curing negatively affected the adhesion of SBU. The newly developed universal adhesive TUB was not affected by the curing conditions.“

(Source: Dr. Katsumata, Dr. Sano et al. Kagoshima University, Hokkaido University; The 35th Annual Meeting of Japan Society for Adhesive Dentistry, 2016)

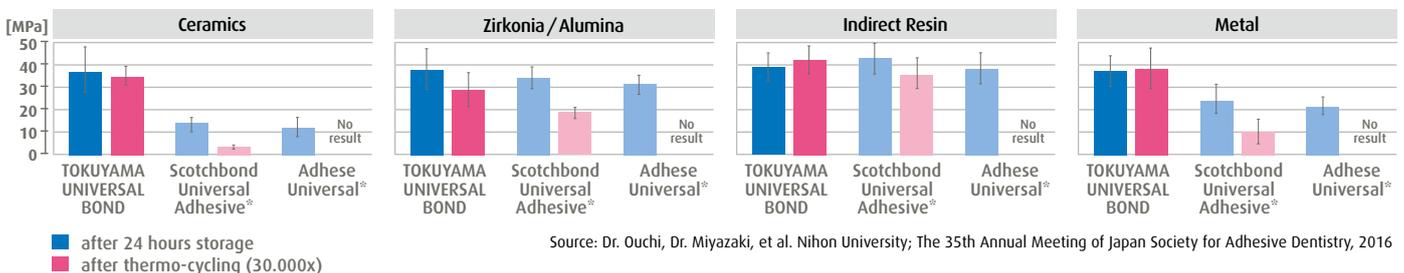
■ TOKUYAMA UNIVERSAL BOND
■ Scotchbond Universal Adhesive*

Applicability on all surfaces

Studies to investigate the shear bond strength (after previous sand blasting with Cojet) on various prosthetic surfaces illustrate the

extraordinary bond strength that TOKUYAMA UNIVERSAL BOND develops independently of the respective material. Even after extensive thermal

cycle loading (30,000 thermal cycles), there is no significant deterioration in the bond strength.



Source: Dr. Ouchi, Dr. Miyazaki, et al. Nihon University; The 35th Annual Meeting of Japan Society for Adhesive Dentistry, 2016

	Two-component adhesive	Single-component adhesive	Universal adhesive
			
	EE-BOND	BOND FORCE II	UNIVERSAL BOND
Group	Dentine adhesive with special phosphorus gel (+ selective enamel etching)	All-in-one adhesive without mixing	Universal adhesive with mixing
Type	3D-SR-Monomer (1th generation)	3D-SR-Monomer (2nd generation)	3D-SR-Monomer with 10-MDP (3rd generation)
Number of components	Two	One	Two
Solvent of the primer	Water, alcohol	Water, alcohol	Water, alcohol, acetone
Mixing process	Not required	Not required	10 seconds
Steps	Etching, rinsing, drying, application, drying, light curing	Application, drying, light curing	Mixing, application, drying
Time required	40 seconds	25 seconds	25 seconds
Recommended polymerisation time	10 seconds	10 seconds	Not required
Method of curing	Light curing	Light curing	Contact curing
Compatible with other makes of light-curing composite	Yes	Yes	Yes
Remarks	Specially for selective enamel etching in conjunction with high-viscosity Etching Gel HV, optimal bond and perfect margin without postoperative sensitivity or sensitivity to technique.	Ideal in conjunction with the ESTELITE product family. Uniform thin film sickness and easy application using the BOND FORCE II PEN, particularly hygienic with the Unit Dose.	Completely universal range of application: can be used for all etching protocols, fully compatible with all composite materials even without activator; can be used on all prosthetic surfaces without restrictions.

EE-BOND



5 ml is sufficient for 320 applications

Complete Kit:

1 x 5 ml bottle, 1 x 2.5 ml etching gel, 25 microbrushes, mixing dish

Refill:

1 x 5 ml bottle, 2 x 2.5 ml etching gel

BOND FORCE II



5 ml is sufficient for 330 applications

Complete Kit:

1 x 5 ml bottle, 25 microbrushes, mixing dish

Refill:

1 x 5 ml bottle

Unit Dose:

50 x 0.1 ml Unit Dose, 50 microbrushes

UNIVERSAL BOND



10 ml is sufficient for 280 applications

Complete Kit:

2 x 5 ml, bottle, mixing dish, 10 disposable mixing dishes, 25 microbrushes

Refill:

1 x 5 ml bottle of fluid A, 1 x 5 ml bottle of fluid B, 50 x disposable mixing dishes

Manufacturer



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