



Clarity™

Esthetic Orthodontic Solutions

# Form meets function: Discover the science behind a versatile self-ligating bracket system

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## Rethink your ceramic self-ligating bracket

As you know, the orthodontic business and treatment models are changing. Patients have more choices than ever, and they're playing an active role in decision making when it comes to the products they purchase. At the same time, emerging technology is driving innovation and new efficiencies in the practice of orthodontics.

3M™ Clarity™ Ultra Self-Ligating Brackets offer the treatment control and flexibility you need for precise and predictable outcomes – helping you create beautiful, confident smiles.



## Take advantage of the Clarity Ultra bracket difference

Customer focus is an imperative for all 3M businesses. Collecting orthodontists' feedback on performance factors and features contributed to designing a bracket to professional specifications.

For instance, the results of a blind survey<sup>n.193</sup> conducted for 3M among orthodontists in the United States and Germany in 2017 showed that reliability and versatility – including door reliability, rotation control, ability to activate by ligation (when needed) and bonding

and debonding reliability – were the most important attributes of any ceramic self-ligating appliance. 3M used survey data to inform the design of the Clarity Ultra bracket.

The top trend in the orthodontic industry today is esthetic treatment. So a fully-esthetic ceramic bracket that shows no metal parts and covers the archwire is still very important, but is not as critical as the reliability and versatility of the appliance.

## Reliability: Door function

When designing the Clarity Ultra Self-Ligating brackets, it was imperative that the door function was reliable.

In laboratory testing, the doors of Clarity Ultra brackets underwent many open-close cycles to validate their reliability. The results showed that the doors survived a minimum of 2X the open-close cycles of a typical treatment<sup>1</sup>.

Another important factor in reliable door function is its stability – the ability to stay closed or open, as intended. Unplanned door opening or closing can either be a minor annoyance or cause a major unintentional delay in treatment. The Clarity Ultra bracket door mechanism is designed to resist unplanned opening or closing<sup>1</sup>.

Clarity Ultra brackets have two parts: the body and the door. The door mechanism includes a 0.007” Nitinol pin, hidden in the bracket body, and blocked on both sides. The pin provides door resilience and stability and is hidden from view, making the bracket esthetic<sup>1</sup> with no metal showing through<sup>1</sup>.

The doors of the Clarity Ultra brackets are designed to provide an audible and/or tactile “click” when opened or closed. The “click” is an indication of the door opening or closing<sup>1</sup>.

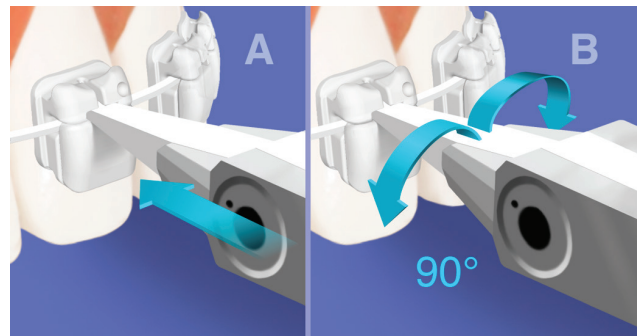
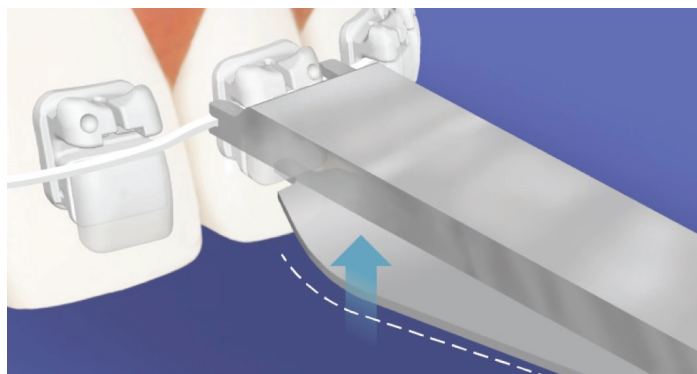
Clarity Ultra brackets have a dedicated double-sided instrument for opening and closing the doors<sup>1</sup>. Using a double-ended instrument reduces the number of hand instruments that are need to be inventoried at the practice<sup>1</sup>.



## Closing the door

Closing the bracket doors using the 3M™ Unitek™ Open-Close Instrument for the Ultra SL System is easy<sup>1</sup>. The closing end of the instrument has two notches that fit all wire sizes and shapes, and can be used to torque and seat the rectangular archwire into the slot before closing the door. In cases of severe crowding or severely rotated teeth, there may not be enough clearance for the notches to grip the wire. In those situations, doors can be closed with fingers.

- Position the tool's notches onto the archwire on both sides of the bracket with the pointer aligned below the bracket's open door.
- Ensure the wire is fully seated deep into the slot by lightly pressing and/or torquing the wire with the tool.
- Squeeze the tool, pushing the pointer against the open door. Continue squeezing until the door is closed.

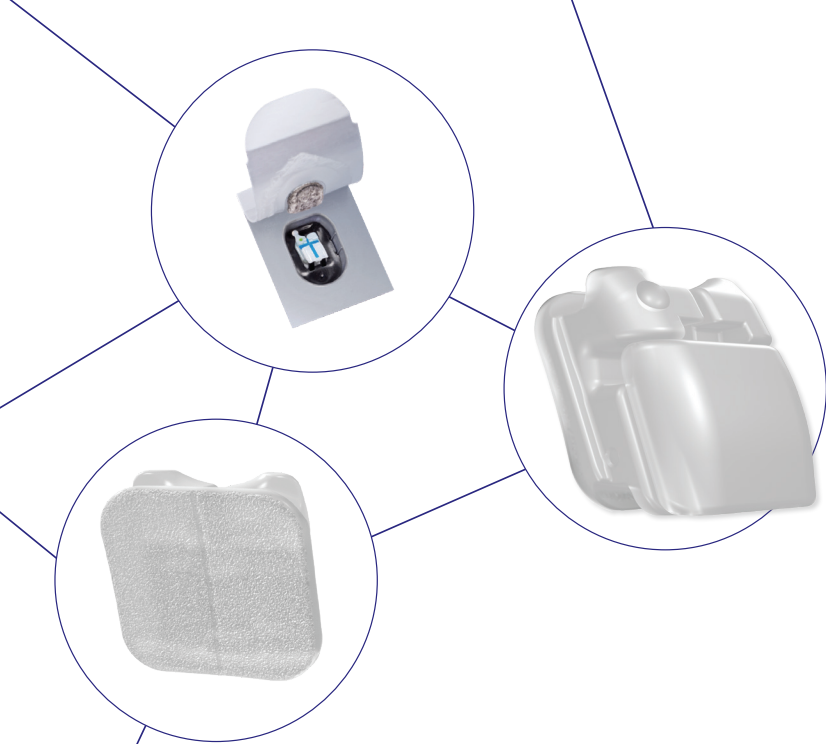


## Opening the door

Opening the doors of Clarity Ultra brackets using the Unitek Open-Close Instrument is simple and easy<sup>1</sup>. Insert the tip of the Unitek Open-Close Instrument into the horizontal groove just above the door, and twist the tool 90 degrees clockwise or counterclockwise.

The opening end of the open-close instrument has a proprietary ceramic tip that not only reduces wear but may also reduce marking the bracket, compared to a metal tip. This means less frequent replacement of the instruments, as they have been designed to withstand 3000 opening cycles. The rectangular design of the tip with the rounded corners allows the tip to easily be inserted into the tool slot.

After insertion, the rotation of the instrument requires only a light twisting motion to generate a reciprocal force to open the door. This is designed to minimize the net force to the tooth. If the door is pulled down using an explorer or other instrument, it may exert a force noticeable by the patient.



### Reliability: Bonding and Debonding

Clarity Ultra brackets are available precoated with the industry-recognized 3M™ APC™ Flash-Free Adhesive. Brackets coated with APC Flash-Free Adhesive have been shown to offer:

- Shorter chairtime during the bonding appointment
- Reduction of bonding steps
- Consistent and predictable debonding process
- Protection of enamel under the bracket due to acid erosion

A glass grit bonding base, as shown in the image above, with uniformly sized grains of aluminum oxide glass, similar to that of 3M™ Clarity™ Advanced Ceramic Brackets, was used on Clarity Ultra brackets. The glass grains cover the entire base from edge to edge. The glass grains are in the shape of polygons that create multi-faceted, mechanical bonding surfaces with multiple surfaces, as shown in the image above, to which the adhesive can adhere.

Clarity Ultra bracket bases were designed with the same proprietary and reliable stress concentrator used in all 3M ceramic brackets, as shown in the image above. This feature is well known in the industry and contributes to the debonding reliability of Clarity brand ceramic brackets.

In addition, each Clarity Ultra bracket is designed with a tooth-specific compound contoured base, similar to Clarity Advanced brackets<sup>1</sup> for a better tooth to base fit. The mesial-distal dimensions of each bracket are specific to the tooth, unlike brackets that have the same mesial-distal width for all the brackets.

### Technology and design

Clarity Ultra brackets are injection molded, using a proprietary, fine-grained, high-strength micropolycrystalline ceramic material. This allows the formation of smooth, molded surfaces, while providing high strength. The uniformity of the small ceramic grain size contributes to the translucency and stain resistance of the bracket<sup>1</sup>.

### Self-Ligating efficiencies

The bracket door design of Clarity Ultra Self-Ligating brackets allows the bracket to retain the archwire and remain passive<sup>1</sup> during treatment. No ligatures are needed, which means no opportunity for stained ligatures which can detract from the esthetics of the brackets<sup>1</sup>. There should be no unscheduled appointments to change stained ligatures, such as before important events.

No required ligatures also means a reduced inventory of ligatures for the practice<sup>1</sup>, and easier archwire changes without having to remove or insert ligatures<sup>1</sup>. When a ligated bracket is used, time is spent with the patient in the chair during every appointment, just to choose the colors of ligatures to be used that day. Removing this variable could reduce chairtime.

### Rotation control

In the survey referenced earlier, 'rotation control' was ranked the second most important attribute of a self-ligating bracket, contributing to the purchase decision for a bracket. Clarity Ultra brackets were designed with a wide door that covers the entire mesial/distal span of the bracket, and provide rotation control without the addition of accessories<sup>1</sup>.

### Versatility: On-demand activation

All U/L 5x5 Clarity Ultra brackets are designed with tie-wings that can be ligated, if desired<sup>1</sup>. The versatility of this bracket allows the practitioner to activate the bracket on-demand, if-and-when it is indicated during the treatment. This also permits patients to request ligature colors to fit their style<sup>1</sup>.



Photo provided by Dr. J. Smith

The proprietary, oval-shaped under tie-wing area is also a unique and important feature<sup>1</sup>. This design allows easy ligation<sup>1</sup> and even double-ligation, if-and-when needed<sup>1</sup>. The bracket can be ligated using metal or elastomeric ligatures<sup>1</sup>, and when control and space closure is needed, chains can be used, even with ligatures<sup>1</sup>.



Hands-on panels were held to evaluate bracket performance. Participant responses indicated that Clarity Ultra brackets are easy to ligate<sup>1</sup>. And when compared to Ormco's Damon® Clear Brackets, evaluators found the Clarity Ultra bracket tie-wings facilitate easier ligation<sup>1</sup>.

### Versatility: Lace-backs can be used during treatment

If following 3M™ MBT™ Verstatile+ Appliance System mechanics, some situations require the use of lace-backs.

- Loosely tie a 0.010 steel ligature wire in a lace-back design, with bracket doors open, prior to placing the archwire
- Insert the archwire and close the doors
- Fully twist the ligature wire end and insert under the archwire
- The lace-back can be removed and replaced during subsequent appointments



Photo provided by Dr. D. Kujat

### Versatility: Optional auxiliary

Another benefit of the tie-wing design of Clarity Ultra brackets is the ability to attach Elastomeric Ligature with Guard on the lower incisors as needed<sup>1</sup>. Sometimes in deep bite cases, or whenever there is a possibility that the upper teeth will occlude with the lower brackets, different strategies can be used to prevent attrition of the upper teeth. One of the strategies is to ligate an elastomeric 'pillow' shaped ligature onto the lower teeth. The Ligature Guards are latex free, available in clear and silver, and easily attach onto the Clarity Ultra brackets to allow the practitioner the added freedom to bond the lower teeth with a ceramic bracket.



### Versatility: Familiar Class II treatment mechanics

Hooks on the Clarity Ultra brackets are another feature that adds to the versatility of the appliances. This is a feature that is not always available with other ceramic self-ligating appliances, causing the practitioner to have to use other auxiliaries and treatment mechanics.

All Clarity Ultra upper and lower cuspid and bicuspid brackets have hooks to allow the use of Class II elastics<sup>1</sup>. The hooks on the upper cuspids and bicuspids are round and bidirectional, similar to Clarity Advanced Bracket upper hooks. They are designed for easy attachment of elastics and have a low-profile design to reduce gingival tissue impediment. The hooks on the lower cuspids and bicuspids have a unidirectional, low profile design.



### Bracket esthetics for patient satisfaction

Clarity Ultra brackets are made of translucent, stain-resistant ceramic for brilliant esthetics. No metal parts show<sup>1</sup>. The ceramic door covering the Clarity Ultra brackets has a smooth, contoured surface designed for patient comfort<sup>1</sup>. Clarity Ultra brackets are designed with a low profile, labial/lingually. This makes the bracket comfortable for the patient and reduces occlusal interference in some cases. Bite blocks, occlusal build-up or ligature guards<sup>1</sup> can be used with Clarity Ultra brackets to reduce occlusal interference.

Lastly, Clarity Ultra ceramic brackets are available U/L, 5x5 for a complete esthetic treatment option. Individually colored ID dots help in easy bracket identification<sup>1</sup>.



### Compatibility with existing systems

Clarity Ultra brackets are compatible with 3M™ Victory Series™ Superior Fit Buccal Tubes<sup>1</sup>, as well as 3M™ Forsus™ Class II Correctors<sup>1</sup>, and can be combined for treatment efficiency. The in/out dimensions of Clarity Ultra brackets are equivalent to Clarity Advanced ceramic brackets and 3M™ Victory Series™ Low Profile Brackets<sup>1</sup>. 3M™ Unitek™ Esthetic Archwires will enhance the esthetic appearance, and 3M™ Unitek™ Lateral Development Archwires can be used to achieve a Platinum Proportion smile, if desired<sup>1</sup>.

### Bringing it all together

You need treatment options designed for efficiency and reliability, from start to finish. Your patients want beautiful smiles – and expect to look good in the process. Clarity Ultra brackets provide a fully-esthetic solution for patients, while allowing you to deliver precise results. For more information, visit [3M.com/ClarityUltra](https://3M.com/ClarityUltra), or ask a 3M representative for a demonstration.

1. 3M data on file.



**Armineh Khachatoorian** received her B.S. in Chemistry from the University of Southern California. She joined 3M in 1997 as a Sr. Technical Service Engineer in R&D. In 2002 she became a Marketing Product Manager and helped launch the 3M™ APC™ Adhesive Coated Appliance Systems, 3M™ Ortholux™ Curing Lights, 3M™ Transbond™ Primers, and others. She is currently a Scientific Affairs Manager, working with new product launches and technical publications.

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