



3M[™] SmartClip[™] SL3 Self-Ligating Appliance System

Technique guide



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Introduction



This comprehensive technique guide details how to use SmartClip Brackets, which feature unique "Intelligent" Clip technology, to take full advantage of the treatment benefits inherent in their unique design.

This technique guide will provide helpful instruction on every stage of treatment when using SmartClip Brackets, from initial placement and positioning, to archwire engagement and disengagement, to final bracket debonding. There are useful tips offered here to ensure a positive experience for the practice and patient.

Five must-do's to be successful

Our doctors report that they experience the most benefits with SmartClip Brackets when they:













Use the recommended archwires sequences

- Avoid inefficiencies of traditional archwire sequences
- Incorporate tandem archwire technique
- Recommended archwire sequence listed on page 10

Train staff on using the bracket systems

- Take the time to practice on typodonts
- Take advantage of training from your Solventum Sales Representative

Extend appointment intervals

- Let the archwire "cook" and fully express itself before moving to a larger archwire
- Enable more efficient management of the office schedule with fewer visits per patient
- Patients will appreciate taking less time off work or school for appointments

Use APC[™] Adhesive pre-coating, and especially, APC[™] Flash-Free Adhesive

- Reduce bonding time and enjoy fewer bonding steps
- More efficient bonding environment
- No flash removal with APC Flash-Free Adhesive

Take advantage of the free time that the system gives

- Spend more time with each patient to develop relationship
- Increase the number of appointments per day
- Train and develop staff
- Spend more time on practice marketing
- Cut down work week to spend time with family

Following these guidelines will allow your practice to optimize your efficiency and experience with the SmartClip Brackets.

Getting started



Handling

Although the SmartClip[™] SL3 Brackets are designed as true-twin edgewise brackets, the addition of the two Nitinol retaining clips require mesial and distal protrusions to hold the clips in place. These protrusions require the user to apply a different approach to bracket handling with bracket tweezers.

The operator can use either reverse tweezers (like the Unitek[™] Bracket Placement Instrument, REF 804-171) or conventional cotton pliers.

The bracket should be securely held by grasping in between the tie-wings and on one side of the bracket (mesial or distal). This will still allow the bracket to be securely held without causing the bracket to "flip off" the instrument. The instrument can also be placed just above the protrusions when grasping a bracket from both sides. The reverse-end blade of the Unitek Bracket Placement Instrument can also be used as a positioning and seating tool for adhesive expression. Unitek[™] Bracket Placement Instrument (REF 804-171)



In-between tie-wing grip.



Mesial-distal grip.

Archwire engagement

The most unique feature of the SmartClip Bracket is the self-ligating mechanism. Unlike other self-ligating systems, the mechanism does not require the user to open or close any doors or clips. Rather, the mechanism is a Nitinol clip that opens to the archwire simply by applying pressure to the clips with the archwire. This pressure varies with the individual archwire dimension and material property. Effective and patient friendly archwire engagement is also dependent on proper archwire sequencing. (see page 10)

Round archwires

Round archwires require no special consideration and can be inserted into the bracket slots by using normal finger pressure against the clips. If desired, a ligature director or the Unitek[™] Wire Insertion Instrument [REF 804-152 (.022 slot) or 804-153 (.018 slot)] can also be used.

Rectangular archwires

Before inserting rectangular archwires, it is recommended that all leveling and alignment and rotations be corrected. This will ensure easier archwire insertion requiring less force. Using the Unitek Wire Insertion Instrument as a torquing key will allow the clinician to align the archwire with the torque angle of each bracket. If desired, the clinician can also use a Weingart plier or other torquing key to torque the archwire into the bracket. This alignment allows the Nitinol clip to open with minimal force.



Insert wire perpendicular to the base of the slot. This may require torquing of the wire.



If the wire does not enter the clip correctly, it can create a positive stop (black arrows) and resist easy wire insertion.



Proper alignment to the slot will also assist in wire engagement.

Single clip engagement

A key feature of the SmartClip bracket is the ability to engage a single clip rather than both clips in initial leveling and alignment. This is especially useful with vertically displaced canines or severely rotated teeth. Engaging only one clip in these situations allows the clinician to increase inter-bracket distances and create a longer lever arm for lighter force corrections. On the next appointment simply engage the remaining clip for final correction. No other self-ligating bracket allows this versatility.



Archwire engagement sequence

When using SmartClip Molar Brackets:



When using traditional molar brackets:



Tips for archwire



Always provide lingual support for enhanced patient comfort



For sensitive patients, have patient bite down on cotton roll before engaging and disengaging archwire to provide occlusal support

Archwire disengagement



Recommended disengagement sequence

As you begin to change archwires in the SmartClip Brackets, make sure that the existing archwire is completely passive and sliding freely before moving into larger archwires. This will ensure that the current archwire has fully expressed itself with the lightest possible amount of force. The ability to use minimal force to move teeth is a key benefit of the 3M[™] Self-Ligating Appliance Systems.

Round archwires

To remove round archwires simply cut the archwire at the midline and slide out the two sections of wire. If the archwire is to be used again, use the SmartClip[™] Appliance Wire Disengagement Hand Instrument (REF 804-160) to disengage the anterior brackets and slide out archwire.

Rectangular archwires

Rectangular archwires should be removed using the SmartClip Appliance Wire Disengagement Hand Instrument. This instrument provides reciprocal force against the bracket and pulls the archwire out of the bracket slot. Please see instructions below on how to use the hand instrument.

If desired, the user can also remove rectangular archwires by disengaging the anterior brackets then sliding the archwire out of the remaining posterior brackets.



SmartClip[™] Appliance Wire Disengagement Hand Instrument (REF 804-160)

Using the SmartClip Appliance Wire Disengagement Hand Instrument (REF 804-160)



Approach archwire with disengagement instrument from occlusal or gingival side.



Place instrument hooks under archwire keeping the bracket between the instrument hooks.



Gently squeeze handles (squeeze until the point of release).



Always provide lingual support for enhanced patient comfort

For sensitive patients, have patient bite down on cotton roll before engaging and disengaging archwire to provide occlusal support

Avoid the mesial and distal protrusions and tie-wings when disengaging SmartClip Brackets to avoid breakage



Bracket debonding

The debonding procedure for the SmartClip Brackets requires no change from your current debonding procedure; conventional methods used with any traditionally ligated metal bracket can be applied.



Unitek[™] Self-Ligating Bracket Debonding Instrument (REF 804-170)

Archwire sequences

Tandem archwires

The use of Tandem Archwires is important in the leveling and alignment phase of treatment for the SmartClip Brackets. Following the initial archwire (typically .014 Nitinol SE) the clinician is recommended to insert a second round Nitinol Classic Archwire, .014 in the .018 slot, or .016 in the .022 slot. In other words, when the initial archwires are completely passive, rather than removing these archwires, a second archwire is to be placed directly on top of the initial archwire, forming a tandem archwire.

The combination of these two round archwires provides maximum control of the vertical, horizontal, and rotational dimension. Proceeding to rectangular archwires should never begin until the tandem archwires have been placed and have expressed themselves. Use of the tandem archwire technique allows for simple and easy insertion of a rectangular archwire.

Tandem archwire combinations

The choice of tandem archwire combination depends on the slot size and degree of rotational deflection. In most cases, the following combination can be used:

Archwire	.018 Slot	.022 Slot
Initial archwire	Nitinol SE .014	Nitinol SE .014
Tandem archwire	Nitinol Classic .014	Nitinol Classic .016



Prior to tandem archwire.



Tandem archwire working.



rather than as a continuous

Clinical tips

archwire Do not insert the tandem archwire until the initial archwire is completely

passive

Do not move to rectangular archwires until all rotations and vertical corrections are complete with tandem archwires



Tandem archwire complete.



Initial archwire

The tandem archwire should be inserted directly on top of the initial archwire used in treatment.

Tandem archwire

Archwire sequencing

Initial archwire sequencing with the SmartClip Brackets is critical to the success of the appliances. Because of the passive nature and low frictional resistance of these appliances, light resilient archwires should be used for initial leveling and alignment. By using small dimensional round wires, the reduction in binding friction can be optimized without compromising control.

As each patient's malocclusion presents its own treatment requirements, archwire sequences should always be modified to best treat each individual case. Below is a generic archwire sequence for your use.

Treatment pha	se	.018 Slot	.022 Slot
01 Initial phase	Getting organized • leveling • aligning Necessary wire criteria • low forces • low modulus • low friction	Nitinol SE .012 or .014	Nitinol SE .014
02 Intermediate phase	 Working the big picture arch form correction occlusal plane leveling rotating tipping Necessary wire criteria medium forces medium working range medium modulus medium malleability low friction 	Nitinol SE .014 with Nitinol Classic .014 tandem	Nitinol SE .014 with Nitinol SE .016 tandem
03 Finishing phase	Getting down to details • vertical detailing • space closure • refine interdigitation • retention Necessary wire criteria • medium forces • short working range • high modulus • high malleability	Beta III Titanium .016 × .025 .017 × .025	Nitinol SE .017 × .025 Nitinol SE .019 × .025 Beta III Titanium .019 × .025

User tips & tricks



Bracket positioning / Interproximal Reduction (IPR)

- Position the bracket slightly off-center on the tooth to help with rotational control. (Figure 1)
- When direct bonding, a plastic filling instrument (PFI-3) works well for bracket positioning. (Figures 2–3)
- All bracket repositioning and IPR should be accomplished early in treatment.







- 1. Complete all alignment activations in light archwires. Avoid skipping intermediate archwires or getting into larger steel archwires until preliminary alignment has been achieved.
- 2. When removing light archwire, assure that it is passive, then: a) segment archwire at midline and slide out; or b) disengage anterior teeth only, then slide out.
- 3. Only use rectangular archwires when existing round archwire is passive. To insert rectangular archwire, engage 2nd bicuspids, slide into buccal tubes, then slide posterior from the midline and engage from posterior to anterior.
- 4. The majority of finishing details can be achieved in Beta III Titanium archwires.
- 5. Archwire segment should not cross edentulous span or non-bracketed teeth. (Figure 4)
- 6. If having difficulty inserting larger rectangular wires, make sure to:
 a) establish vertical alignment of teeth and brackets with tandem archwires;
 b) complete all rotation corrections with tandem archwires;
 and c) verify that the torque factor is not overly active. If large rectangular wires are still difficult to insert, step down to a smaller rectangular wire. (Figure 5)
- 7. To correct difficult rotations in the lower anteriors: a) use tandem archwires; b) open the contacts in the mandibular anterior segment with a .012 SS wire with loop; c) offset brackets by 0.5 mm towards the rotation; and d) avoid uneven resin thickness under the bracket bases.







Friction

The twin design of the SmartClip Bracket allows for intimate control of friction when desired. Here are several recommended techniques that take full advantage of the versatile bracket design:



Prevent sliding: To stabilize and prevent the archwire from sliding, apply an Alastik^T Ligature Tie on the most anterior tooth that needs the least amount of correction.



Secure rotations: Secure previously corrected rotations when stepping back to a smaller archwire.



Selective friction: Friction can be useful. Whether it's maintaining midlines, for torque control or maintaining rotation control, determine where it works best, and secure the bracket.



Create space: Use open coil to create space on initial wires.

Selective clip engagement

Use the flexibility of the twin wing and clip design to selectively engage the archwire for severe rotations. Begin by engaging only one clip until preliminary rotation correction is achieved. Forcing in an archwire will increase the risk of distortion and spontaneous disengagement.



One clip engaged.



Risk of deformation.

Tandem archwires

- Use tandem archwires to correct residual rotations and level and align arches. The tandem archwires will allow you to do bracket repositioning early in treatment. (Figures 6–8)
- Use reverse curve archwires as part of the tandem arch when necessary. (Figure 9)
- Use segmented tandem archwires where more correction is needed. (Figures 10-11)





During.



After.





Tandem archwires.



21 days with tandem archwires.

Mechanics

- Reduced friction enhances sliding mechanics for initial space closure using lace backs. (Figures 12–13)
- Chain to adjacent teeth to correct rotations. (Figure 14)
- Express full rotation correction with a small step bend or offset while still in light round archwires. (Figure 15)
- Use NiTi springs to slide teeth along archwire. They deliver consistent, constant force. Attach to bracket hooks or posted archwires. (Figures 16–17)
- Chain to control arch width instead of stainless steel wire. This helps seat the archwire against the bracket base. (Figure 18)
- Bond mandibular 3-3 retainer as initial stage of finishing. The retainer secures incisor position and facilitates bicuspid settling. (Figure 19)
- For closing small spaces with SmartClip Brackets, avoid using powerchains as they may be inefficient, redundant and unhygienic. Simple, crimpable hooks and AlastiK[™] Ligature Modules are effective for closing small spaces. For generalized space closure, however, powerchains are still useful. (Figure 19)



















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