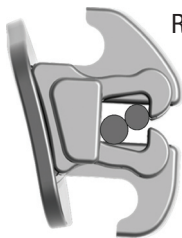


# Tandem Archwire Use in 3M Self-Ligating Appliance Systems

by Dr. Anoop Sondhi, Indianapolis, IN and Barry Grant, 3M Unitek

One of the unique aspects of passive self-ligating appliance systems is the ability to control 1st and 2nd order movements with the use of small dimension round nickel titanium archwires that deliver low forces. At first glance, “control” may appear to be an oxymoron, since the bracket slot lumen and the small round archwires allow for significant play in the system. It is this play that allows for the effortless unraveling of crowded teeth, but it also presents a challenge when we want to control these movements. How can we accomplish both?

With the SmartClip™ and Clarity™ SL Self-Ligating Appliance Systems, initial leveling and aligning can begin with 0.014 Nitinol SE archwires. As with any archwire sequence, there will be instances where a smaller 0.012 Nitinol SE archwire may be needed, depending on the level of crowding. This is true in both the 0.018 and 0.022 slot systems. These initial archwires will begin leveling and aligning of the teeth, but not complete it. Once the archwire is no longer being deflected, due to the “play” between the small round archwires and the bracket slot, the unloading forces are diminished and tooth movement stops.



Rather than moving to a larger archwire, the SmartClip and Clarity SL appliance systems are most receptive to the addition of another tandem round archwire. It is this tandem archwire that provides the needed control for both the 1st and 2nd order corrections. The brackets easily accept and retain these tandem

archwires, since the total unloading forces do not exceed the clip release point; this is a key element of the SmartClip and Clarity SL appliance systems. The clip technology is designed to release the archwire when a higher than desirable force level is activated. In other self-ligating systems with static self-ligating mechanisms, the brackets will accept a larger size archwire, and higher force levels that may be beyond a desired force level. These higher force levels are associated with high deflection angles and may result in slower tooth movement due to extended periods of hyalinization that can compromise the efficiency of the self-ligating systems. With the SmartClip and Clarity SL self-ligating systems, the brackets will only accept and retain force levels that are for optimum patient comfort.

Incorporating the tandem archwires into your archwire sequence will facilitate the insertion of the next archwire, which in most cases can then be the first rectangular archwire. The tandem



**Fig. 1** These four illustrations demonstrate the effectiveness of the tandem archwire in a mandibular arch with relatively simple crowding. The initial archwire was an .014 Nitinol SE archwire, and the second archwire was an .014 Nitinol that was placed in tandem.

The fourth picture demonstrates the corrected rotation. It would now be a simple matter to place a rectangular finishing archwire.



**Fig. 2A** This occlusal view of a mandibular arch shows a residual rotation on tooth #24, as well as a recently repositioned bracket on tooth #21.



**Fig. 2B** Close up view of the repositioned bracket on tooth #21.



**Fig. 3A** Occlusal view shows .014 Nitinol archwires placed in tandem in the mandibular arch discussed in Fig. 2A.



**Fig. 3B** The corrected rotation of the mandibular arch.



**Fig. 3C** A close up view of corrected rotation rectangular archwire could now easily be placed for completion of treatment.

archwires provide complete rotational and angulation correction, as well as full vertical correction due to the vertical alignment of the two archwires. Thus, an evaluation of bracket positioning can be completed following alignment with tandem archwires, and any needed bracket repositioning can be completed before progressing to rectangular archwires.

The use of the SmartClip and Clarity SL Self-Ligating Appliance Systems in your practice can be a very rewarding experience for you, your staff and your patients, but their use does require a new understanding of mechanics. Try incorporating the tandem archwires into your treatment – it can make a world of difference. Outlined on page 3 are some suggested archwire sequences which include the tandem archwires for both the 0.018 and 0.022 slot systems.

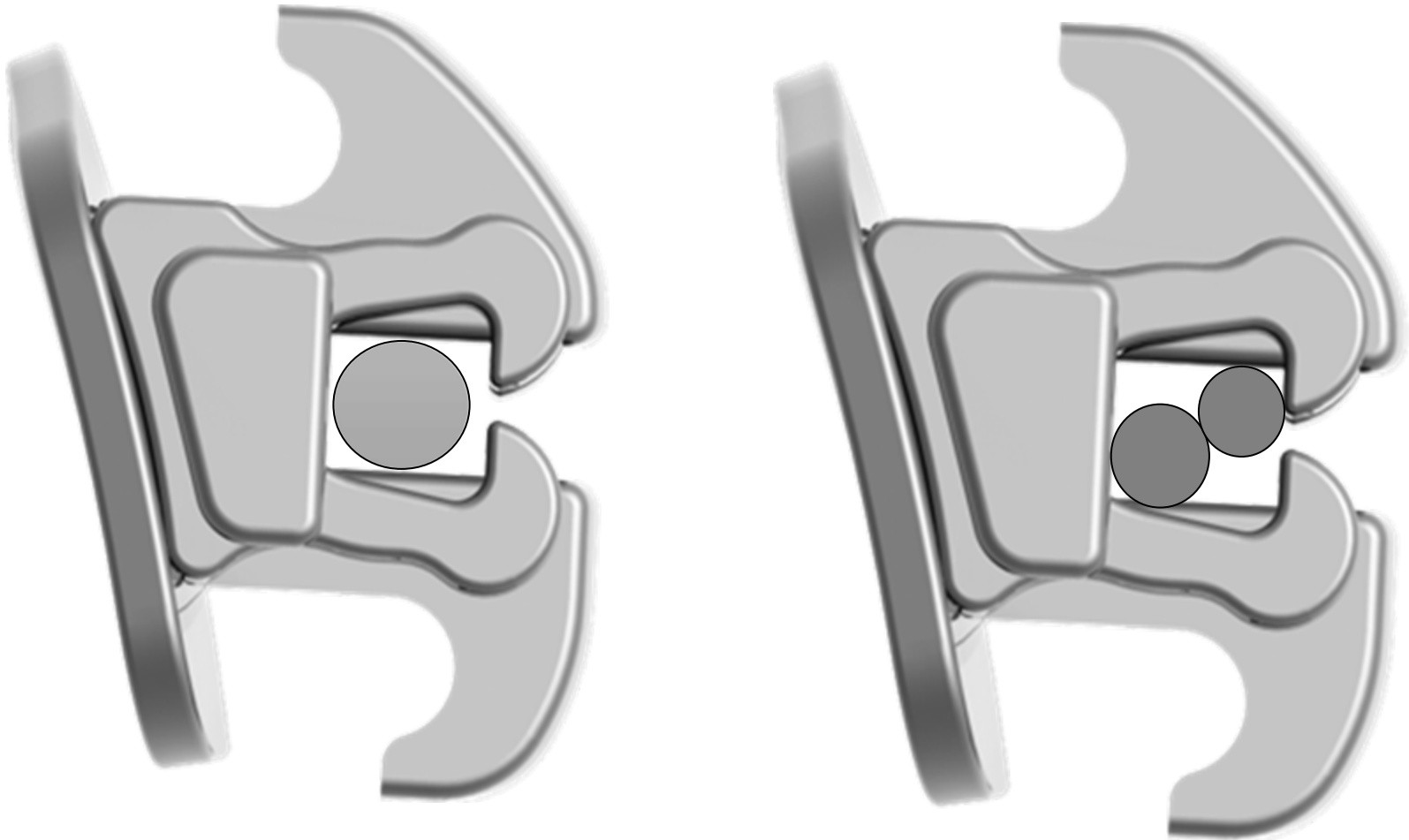
Clarity™ SL and SmartClip™ SL3 Self-Ligating Brackets

# Tandem Archwires with 3M Self-Ligating Brackets



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# Tandem Archwires: Filling the Slot



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# Tandem Archwires

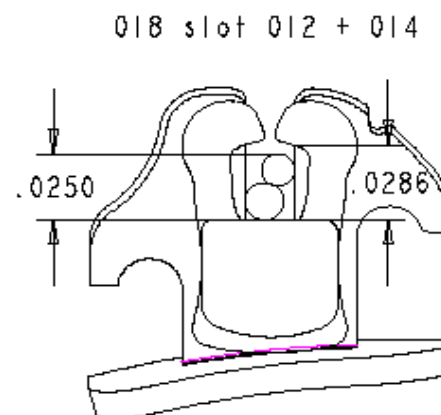
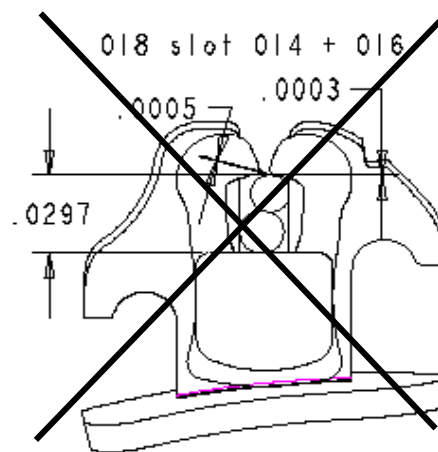
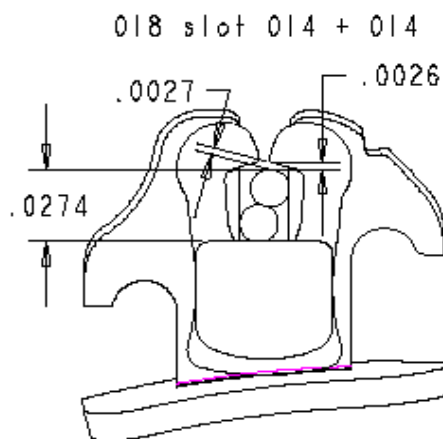
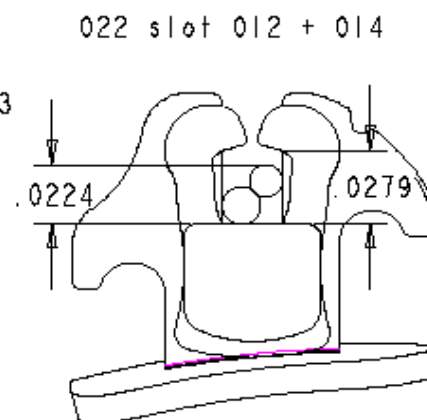
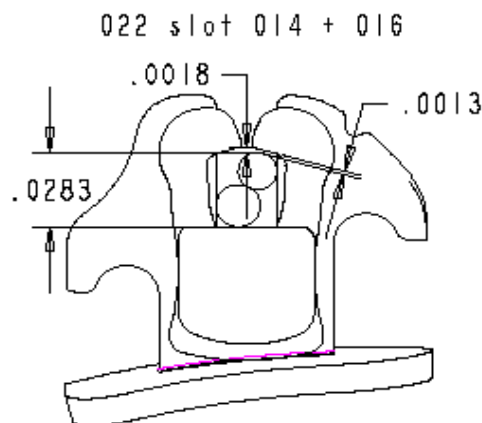
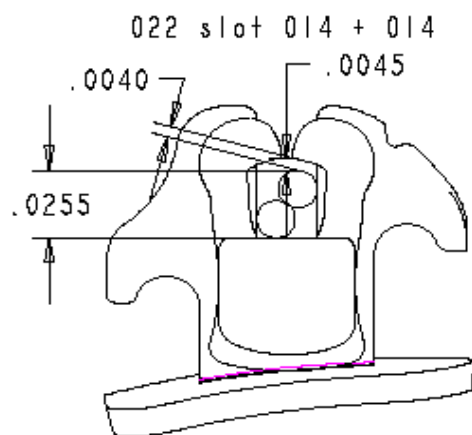
- Significant results have been seen in correcting rotations and creating leveling and alignment when using tandem archwires with 3M Self-Ligating Appliances
- To correct rotations and level and align teeth early in treatment, the goal is to engage archwires that fill the horizontal plane **and** have a low unloading force
- Using two flexible round archwires in tandem fills both the horizontal and vertical planes of the bracket slot
  - *They correct and manage rotations while correcting vertical discrepancies*
- The tandem archwire should be inserted directly on top of the initial archwire used in treatment
  - *No need to disengage the initial archwire, which saves chair time*



# Tandem Archwires: Dimension Details

SmartClip Lower Anterior  
with Cradle Clip

SCALE 20.000



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## Tandem Archwire Combinations

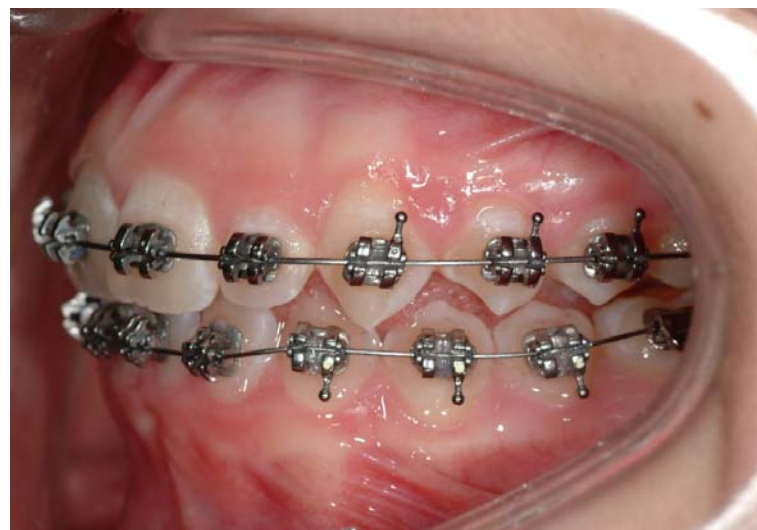
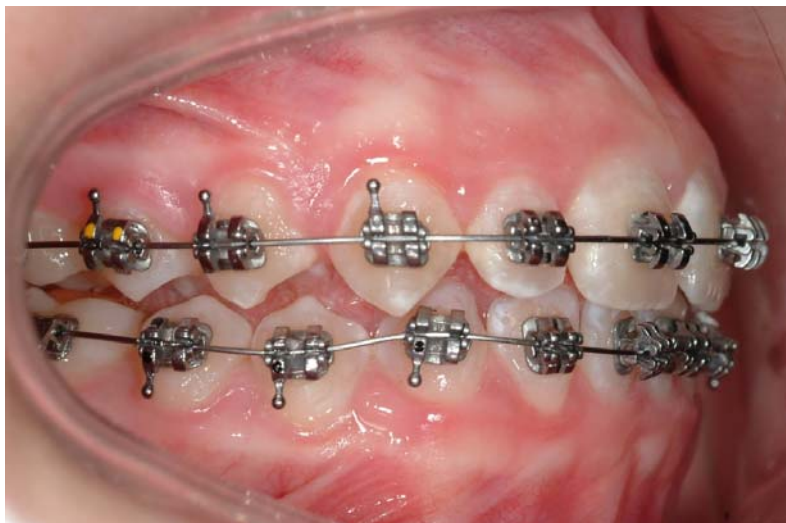
Slot	Initial Archwire	Tandem Archwire
.018/.022	.012	.014
.018/.022	.014	.014
.022	.014	.016

- Tandem archwire combinations depend on the slot size and degree of rotational deflection
- In most cases, the .018 slot option will be the .014/.014 and the .022 slot will be the .014/.016 combination



**Upper: .016**

**Lower: .014**



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**.014**



**Initial .014/.016 Tandem**



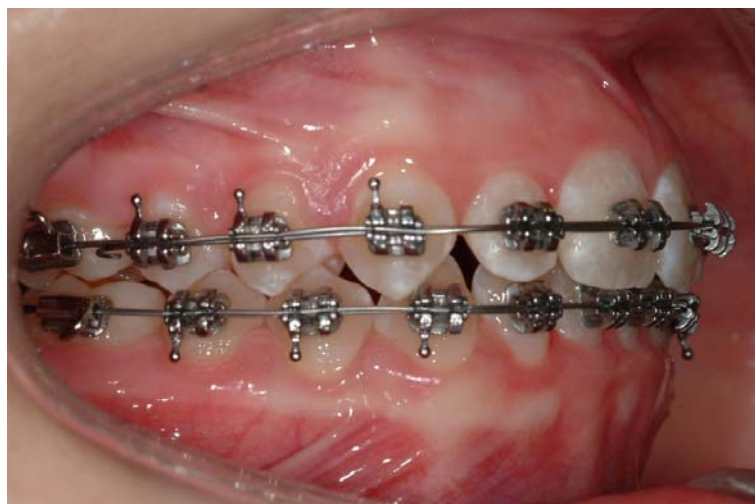
**Final .014/.016 Tandem**

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**Upper:  
.016 and .014**

**Lower:  
.016 and .014**



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