

Improved Archwire Sequence for Insignia™

Abstract

Archwire sequencing is important for efficient management of malocclusion with a digital appliance. Flexible copper-nickel-titanium (CuNiTi), rigid stainless steel (SS) and adjustable titanium-molybdenum-alloy (TMA) archwires all play a role. There are four phases in Insignia™ progressive archwire therapy: (I) stock light round wires (CuNiTi), (II) rectangular CuNiTi wires, (III) major mechanics with SS, and (IV) finishing with CuNiTi and TMA. This article recommends a revised archwire sequence for Insignia™ passive self-ligation brackets (SLB) based on clinical experience. (*J Digital Orthod* 2019;53:76-78)

Key words:

Insignia™ system, passive self-ligating bracket, archwire sequence, custom bracket

Insignia Archwire Sequencing			
I	Stock light round wires	0.014-in stock Damon CuNiTi	Start tooth movement, leveling, initial rotation control, arch form development.
		0.016-in / 0.018-in stock Damon CuNiTi	Align severely crowded teeth, prepare for the second phase.
II	Rectangular wires	0.014 x 0.025-in Insignia CuNiTi	Rotation control and alignment.
		0.018 x 0.025-in Insignia CuNiTi	Consolidate anterior spaces.
		0.021 x 0.025-in Insignia CuNiTi	Torque establishment.
III	Major mechanics	0.019 x 0.025-in Insignia stainless steel (SS)	Space closure, anterioposterior dental correction, buccolingual control.
IV	Finishing	0.021 x 0.025-in Insignia CuNiTi	Torque control.
		0.021 x 0.025-in Insignia TMA	Finishing bends.

■ Table 1: Recommended arch wire sequence for an Insignia™ SLB system.

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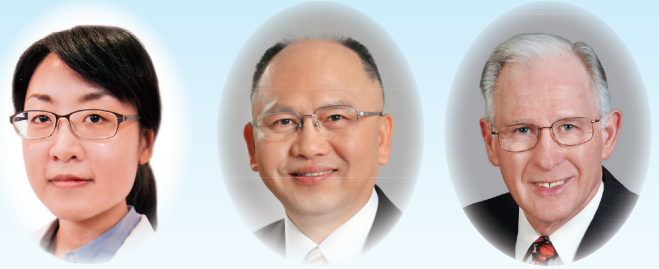
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Introduction

Insignia™ (Ormco, Glendora, CA), is a comprehensive orthodontic treatment system produced with computer-aided design (CAD) and computer-aided manufacture (CAM). A digital design of an ideal alignment (CAD) as specified by the clinician is reverse engineered to produce a customized fixed appliance (CAM). Based on preferences and clinical experience of the doctor, Insignia™ offers clinical efficiency for controlling and minimizing variables to achieve an optimal outcome. This report recommends an improved archwire sequence for Insignia™ passive self-ligating brackets (PSL) (Table 1).

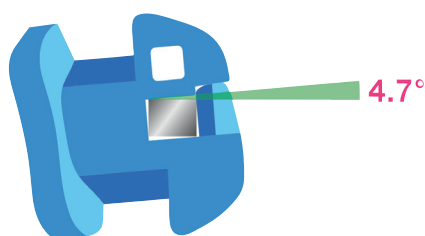
Phase I: Stock light round wires (0.014, 0.016/0.018-in CuNiTi)

In the first phase, the intent of the initial round archwires is to apply light loads to malaligned teeth to initiate arch alignment. The intent of the initial archwire is to align teeth and bracket slots just enough to progress to the second phase.

Phase II: Rectangular wires (0.014x0.025, 0.018x0.025, 0.021x0.025-in CuNiTi)

This phase completes rotation control and leveling, initiates 2nd and 3rd order control of root angulations, and closes space in anterior segments. The

0.021 x 0.025 CuNiTi

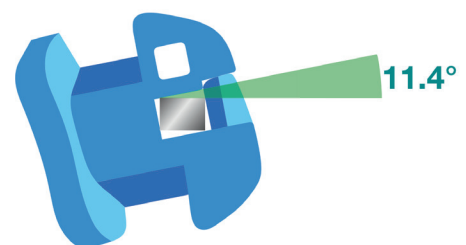


Torque establishment

■ Fig. 1:

Establish torque (3rd order loading) with 0.021x0.025-in CuNiTi archwire because the small play (4.7°) between the archwire and the slot.

0.019 x 0.025 SS



Space closure

■ Fig. 2:

Torque loss reflects palatal tipping of incisors, due to decreased 3rd order loading, because the play between the archwire and the slot increases to 11.4°.

0.021x0.025-in CuNiTi archwires are used for third order control (*torque establishment*) as shown in Figure 1.

Phase III: Major mechanics (0.019x0.025-in SS)

This working phase includes posterior space closure, anteroposterior (A-P) dental correction, and buccolingual control. Loss of torque is attributed to an inadequate 3rd order load during space closure and A-P correction, that is due to play of 11.4° between the archwire and slot (Fig. 2).

(A) Posterior space closure

Rounding the Archwire: Smoothing off the sharp corners of 0.019x0.025-in SS archwire in the posterior segments facilitates sliding mechanics by controlling friction (Fig 3a, 3b).

(B) A-P dental correction

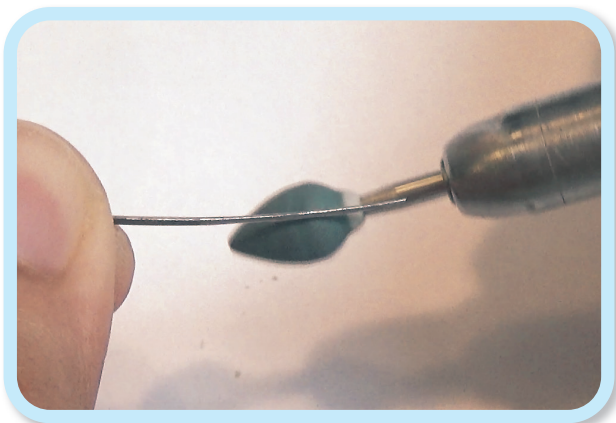
Elastics: Medium/heavy force (3.5-4.5-oz) elastics for Class II or Class III mechanics.

(C) Buccolingual control

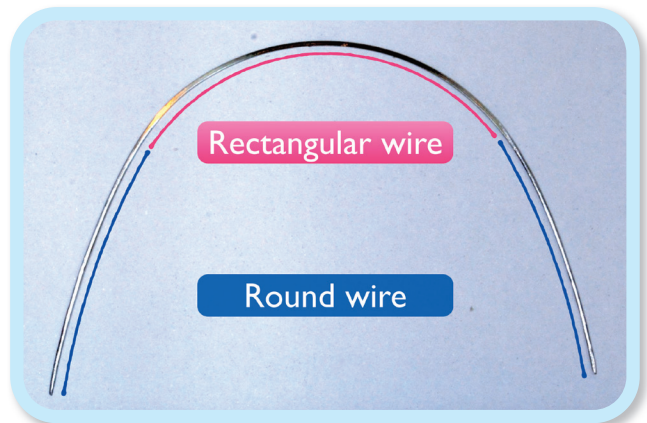
Archwire Adjustment: Expand or constrict an 0.019x0.025-in SS archwire to arch widths.

Phase IV: Finishing (0.021x0.025-in CuNiTi, 0.021x0.025-in TMA)

In the fourth phase, large archwires are used to regain any torque (3rd order correction) lost during phase III mechanics, while simultaneously detailing the alignment to finish treatment.



■ **Fig. 3a:** Round the posterior section of the 0.019x0.025-in SS archwire with a green stone bur.



■ **Fig. 3b:** Simulate a "round wire" configuration of the posterior segments to enhance sliding mechanics during space closure.