# Efficient Bonding Protocol for the Insignia<sup>®</sup> Custom Bracket System

## Abstract

The Insignia<sup>®</sup> appliance is reverse-engineered from a digital set-up of the prescribed dental alignment. Each bracket configuration, and position on the tooth, is specified by the ideal alignment of each tooth engaged on the full-size finishing archwire. Precise bonding of a custom bracket in its designated position is vital for achieving the prescribed intermaxillary alignment without the necessity for detailing adjustments. The recommended bonding procedure for Insignia<sup>®</sup> is: 1. dry fit jig groups to the appropriate teeth on casts, 2. acid etch, rinse and seal enamel surfaces with primer, 3. coat bracket pads with a thin layer of adhesive, 4. position jigs on the lingual cusp or incisal edge of the tooth, and then roll the coated pad into the proper position on the facial surface, 5. maintain finger pressure on the jigs at about a 45-degree angle to the enamel surface(s), 6. light-cure the resin for half of the recommended time, 7. release the finger pressure and apply the last half of the light cure passively, 8. gently spray the bracket and jig assembly with water to dissolve the soluble glue connecting them, and 9. remove the jig from each bracket, by loosening it with a Weingart utility plier in a mesiodistal direction, and then rotating it to the lingual. Repeat this procedure until all brackets are bonded in the ideal position. (J Digital Orthod 2018;49:100-106)

#### Key words:

Insignia<sup>®</sup> system, passive self-ligating bracket, bonding procedure, custom bracket, digital set-up

## Introduction

Insignia<sup>®</sup> (*Ormco, Glendora, CA*), is a computer-assisted design and manufacturing (*CAD/CAM*) process for producing a specific fixed appliance system to treat a malocclusion. Custom brackets and archwires to achieve the prescribed alignment are produced by a reverse engineering process, based on the digital set-up of final intermaxillary occlusion. Precise placement of each bracket is critical for producing a three-dimensional (*3D*) alignment to efficiently accommodate the final rectangular finishing wire, with no need for detailing adjustments. Positioning jigs for each bracket are fabricated to assist the clinician in accurately bonding or rebonding the prescribed custom attachment on each tooth.<sup>1-3</sup> The purpose of this report is to describe a standardized protocol for efficiently placing the custom appliance in the prescribed position. All orthodontic supplies and auxiliaries described in this article were produced by the same manufacturer (*Ormco, Glendora, CA*), unless otherwise stated.

### Preparation for Bonding

Prior to the installation appointment, the clinician and assistant(s) should inspect the following items in the patient's kit box (*Fig. 1*):













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#### **Fig. 1**:

The patient's kit box shown (a and b) contains custom prescription brackets fitted to placement jigs (c), six upper and six lower custom archwires with labels (d), replacement jigs for each tooth if rebonding is required (e and f), and case paperwork describing special treatment procedures (g).

- **1. Custom prescription brackets with well fitted application jigs** (*Fig. 1c*): The brackets for each quadrant are packed together.
- 2. Six upper and six lower custom archwires with labels (Fig. 1d).
- **3.** A setup of individual replacement jigs for each tooth (*Figs. 1e-f*): The first and second molars have brackets already loaded.
- **4. Case paperwork** (*Fig. 1g*): Clinicians are alerted to anticipated bracket interference with occlusion, that requires bite turbos or other composite buildup on the occlusal surface to open the bite. If there is substantial crowding some brackets may be designated for placement later in treatment.

**Clinical tip**: The custom-fit group jigs should be dry fitted to dental casts of the malocclusion for two reasons: (1) check the bonding positions, (2) determine if there is any jig interference when adjacent brackets are properly positioned (*Fig.* 2)

## **Bonding Process**

## 1. Tray Arrangement:

Place the jigs and bonding instruments in the desired order, usually in the progression that they are used (*Fig.* 3). The arrangement may vary according to the desired tray position relative to the patient, and the handedness of the clinician and assistant.



#### Fig. 2:

Group jigs are placed on dental casts to check the fit. Jig interference (yellow arrows) is noted between the lower left canine and 1<sup>st</sup> premolar, during the prescribed bonding procedure. Both occlusal (a and b) and the left lateral perspectives (c) are shown. It follows that the lower left 1<sup>st</sup> premolar and 1<sup>st</sup> molar group jig must be removed before applying the group jig to bond the lower left canine and adjacent incisors.

## 2. Isolation Procedure:

Begin moisture control by placing dry aids on the cheek mucosa to block the parotid gland orifice and isolate the soft tissue. Super absorbent pads are used between lower molars and the tongue to control saliva secretion by the sublingual glands. An OptiView<sup>®</sup> lip and cheek retractor is positioned to provide a clear view of the entire oral cavity including the buccal surfaces of the molars (*Fig. 4*).



#### **Fig. 3**:

Ensure bonding instruments are laid out in the desired order: (a) mirror and cotton tweezers, (b) custom prescription brackets with custom fit placement jigs, (c) dry aids and super absorbent pads, (d) scaler, Weingart plier and filling instrument, (e) lip and cheek retractor, (f) bonding agent, etching-gel, microbrushes, (g) adhesives and uni-dose applicator. See text for details.



#### Fig. 4:

Compared to conventional retraction (left), an Optiview<sup>®</sup> lip and cheek retractor (right) is more comfortable for the patient, and improves intra-oral visibility.



#### **Fig. 5**:

Insignia® bonding procedures are organized into a step-by-step protocol: (1) dry fit the group jigs, (2) apply etching-gel, (3) rinse, spray, and dry, (4) coat etched surfaces with the bonding agent (primer), (5) apply a thin layer of adhesive resin to each bonding pad with a filling instrument, (6) use cotton tweezers to grip the jigs, (7) rotate the pad and jig from the lingual cusp or incisal edge to the facial surface, and apply pressure from a 45-degree angle (yellow arrow), (8) use a microbrush dipped with bonding agent to clean off excess adhesive, (9) spray the jig-bracket assembly with water, (10) use a Weingart plier to release the jig from the brackets on the mesial and the distal surfaces, and then by rolling it gently to the lingual (yellow curved arrows) to remove the jig(s) from the upper (11) and lower (12) arches.

## 3. Step-by-Step Protocol:

- (1) Dry fit the group jigs to the initial casts to identify any problems in sequentially positioning the bondable pads on each tooth.
- (2) Apply etching-gel for 30 seconds to the facial surface of each tooth.
- (3) Rinse throughly with water spray for a minimum of 5 seconds per tooth and air dry.



#### Fig. 6:

For the premolar extraction case shown, teeth with red Xs will be extracted. Place segmental 0.014-in CuNiTi archwires that terminate distal to the canines and mesial to the extraction sites. At the terminal ends of the segments, leave about 4mm of wire to curve lingually to ensure patient comfort.

- (4) Apply the bonding agent (*Ortho Solo*<sup>®</sup>) onto all teeth to be bonded. No air-drying or light curing step is required.
- (5) Apply a thin coat of adhesive to each bracket pad with an application instrument such as LiquidSteel PolyFill Plasma+<sup>®</sup> (*Carl Martin, Solingen, Germany*).
- (6) Use cotton tweezers to grip the jigs.
- (7) Roll the jigs, from the lingual cusp or incisal edge, to the facial surface to prevent disturbing the adhesive layer by sliding the pad along the tooth surface. Once firmly seated, maintain pressure on the jigs with finger force, applied 45-degrees to the enamel surface. This procedure ensures uniform contact between each pad and the respective tooth.<sup>4</sup>
- (8) Assuming the correct amount of adhesive was applied to the pad, there will be no excess when the pad is pressed onto the tooth surface. If adhesive extrudes from between the tooth and pad, use a microbrush dipped in the bonding agent to remove the excess.
- (9) Maintaining firm finger pressure as previously described, use the curing light for half the time specified, then release the finger pressure and complete the second half of the curing process in a passive manner.

- (10) Lightly spray the bonded bracket and attached jig with water for several seconds to dissolve the adhesive holding them together.
- (11) Use a Weingart utility plier to gently remove the jigs from the brackets. Begin by loosening the attachment in a mesiodistal direction. Then remove the jig by rolling it to the lingual, in a reversal of the path used to seat the pad on the surface of each tooth. Make sure the bond is broken on all surfaces of the bracket before completely removing the jig.
- (12) Insert the first prescribed archwire, usually a stock 0.014-in CuNiTi, to begin alignment (*Fig.* 6).<sup>5</sup>

# Conclusion

The recommended bonding procedure is extremely important for Insignia<sup>®</sup> custom brackets. Properly installing the precise, digital device is readily accomplished in a relatively brief appointment by adhering to the standardized bonding protocol.

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