



Restorative Manual



Hex-Lock Abutment System

Hex-Lock Abutments are manufactured from titanium alloy and used as the support foundation for single- or multiple-unit cement-retained, partially edentulous fixed restorations. These abutments consist of an abutment (fixation) screw and a preparable base which consists of a profiled upper portion, and an apex with a hex configuration with one-degree tapered flats, enabling it to friction-fit to the hex of the implant. The abutment base can be modified either chairside or in the laboratory, to create a variety of contoured margins and abutment profiles to emulate the contours of the natural teeth it is replacing. Once prepared, these abutments are attached to the implant and impressed following conventional crown and bridge techniques.

Cemented Crown



Cemented Fixed Partial Denture



Cemented Fixed Partial Denture



Abutment for the Internal Hex Implant, 3.5mmD platform



Hex-Lock Abutment
[HLA3/4]



Abutment for the Internal Hex Implant, 5.7mmD platform



Hex-Lock Abutment
[HLA5/6]



Abutment for the Internal Hex Implant, 4.5mmD platform



Hex-Lock Abutment
[HLA4/5]



Abutment for the AdVent Implant, 4.5mmD platform



Hex-Lock Abutment
[AVHL/4]



Abutment for the Wide Platform AdVent, 5.7mmD platform



Hex-Lock Abutment
[HLA5/6]





Selecting the Hex-Lock Abutments

Fabricate the working cast utilizing one of the transfer procedures mentioned in the previous section. *Hex-Lock* Abutments (“abutment”) consist of an abutment body and an abutment screw. Abutments and corresponding transfers are available in a variety of diameters and flares designated for specific tooth locations. Note: The abutment should have the same profile as the Healing Collar and Direct or Indirect Transfer. For the *AdVent* Implant with the 4.5mmD platform, the Indirect Transfer [AVIT/4] is used for both the 4.5mmD and 6.5mmD *Hex-Lock* Abutments. The *AdVent* Implant with the 5.7mmD platform uses the Indirect Transfer [HLT5/6], matching the 5.7mmD platform of the *Tapered Screw-Vent* product line.



Seating the Hex-Lock Abutments

Interdigitate the abutment’s hex with the hex of the Implant Analog in the working cast (or implant in the patient’s mouth) and place the abutment onto the Implant Analog (or implant). Thread the abutment screw through the abutment body and into the Implant Analog (or implant) with the Hex Tool. To complete seating and create a friction-fit connection, tighten the abutment screw to 30 Ncm with a calibrated torque wrench.

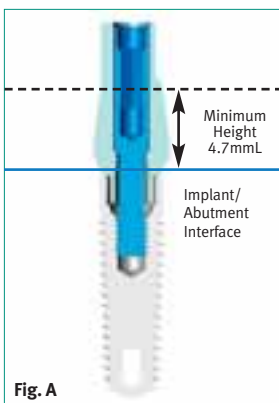


Fig. A
Hex-Lock Abutment with optional Abutment Screw [HLTS2].

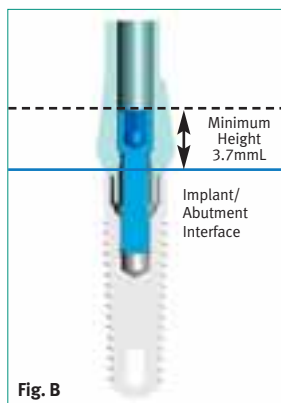


Fig. B
Hex-Lock Abutment with standard Abutment Screw [MHLAS].

Determining Hex-Lock Abutment modifications

Hex-Lock Abutments extend 8.7mm vertically above the implant/abutment interface. Visually determine the modifications necessary for establishing marginal and vertical contours. The abutments have one score line placed 4.7mm above the top of the implant. When using the [MHLAS] Screw (included with the abutment), the maximum preparation on the abutment is 1mm below this line (Fig. B). If using the taller [HLTS2] Screw (sold separately), do not prepare the abutment below the score line in order to preserve adequate hex engagement within the screw (Fig. A).

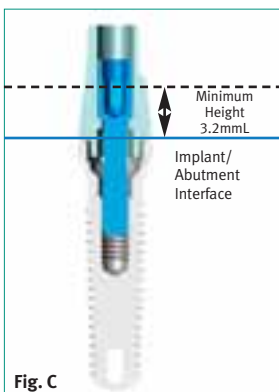
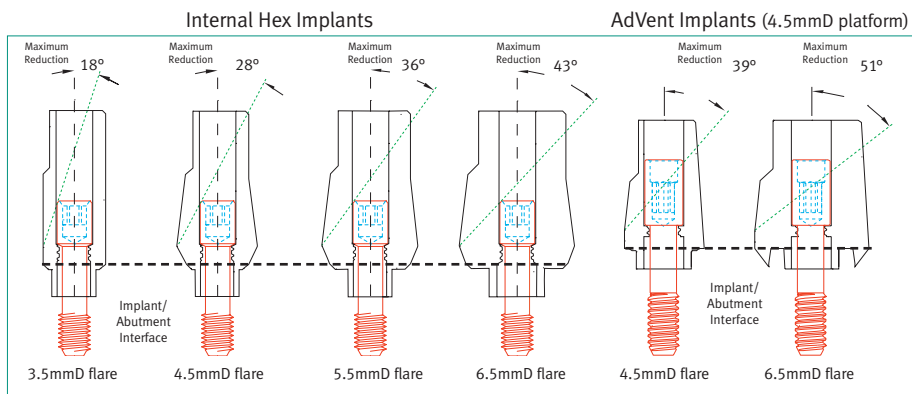


Fig. C
AdVent Hex-Lock Abutment with Abutment Screw [AVHLS].

Determining AdVent Hex-Lock Abutment modifications

Hex-Lock Abutments for the *AdVent* Implant extend 7.0mm vertically above the top of the implant/abutment interface. Visually determine the modifications necessary for establishing marginal and vertical contours. To preserve sufficient hex engagement within the abutment screw, do not vertically reduce the abutment below the score line. This reduction will produce an abutment 3.2mm in height above the top of the Implant Analog (or implant).



Preparing abutments to maximum angle

Hex-Lock Abutments can be prepared at an angle to achieve mutual parallelism and to create a favorable path of draw for the prosthesis. When these components are used with the standard Abutment Screws [MHLAS], the maximum angles of correction shown on the left can be achieved.



Marking the abutment for desired preparation

Mark the required modifications to achieve appropriate vertical clearance as well as gingival contours. Note: The reduction of the abutment needs to take into consideration the following:

- 1) Type of restoration (for example, a ceramic or metal margin).
 - 2) Desired thickness of alloy.
 - 3) Desired thickness of veneering material.
 - 4) Occlusal considerations: centric occlusion, protrusive or lateral excursion.
- Use the Hex Tool to loosen and remove the abutment screw. Thread the Removal Tool [TLRT2] through the access channel in the abutment and rotate in a clockwise direction. Continued rotation of the tool will result in the abutment lifting off the implant.



Modifying the Hex-Lock Abutments

Attach the abutment to an additional Implant Analog located within the Abutment Holder [ABTH]. Modify the abutment with cut-off disks, heatless stone wheels and 12-fluted carbide burs. Use a diamond bur to define the margins. Create a dimple on the buccal surface to help orient the abutment on the implant. Preserve or redefine a flat surface as an anti-rotational feature. If modifying the abutments chairside, **proceed to placing the prepared abutments.**



Fabricating the provisional prosthesis

Replace the abutments on the working cast and make final adjustments. Take care not to damage the soft tissue material, which can be removed from the working cast, if necessary. If a diagnostic wax-up was made, make an alginate impression over it and pour the impression in dental stone. Mold a clear acrylic sheet onto the cast of the diagnostic wax-up according to the manufacturer's instructions. Remove the mold from the cast. Occlude screw access holes and lubricate the abutments and working cast and then flow temporary material into the areas of the abutments and missing teeth in the mold. Seat the mold onto the cast containing the prepared abutments. Trim the resulting provisional prosthesis and return it with the prepared abutments to the dentist.



Placing the prepared abutments

Sterilize the prepared abutments before replacing them into the patient's mouth. Interdigitate the hexes of each abutment and implant utilizing the dimple to orient the abutment in the correct spatial position. Thread the abutment screw through the abutment body and into the implant with the Hex Tool. Tighten each abutment screw to 30 Ncm with a calibrated torque wrench.



Making final adjustments to the abutments

With a round-end, 12-fluted carbide bur in a high-speed handpiece, make minor modifications to the gingival and vertical contours of the abutments under copious irrigation. After completing final modifications, retighten the abutment screws to the recommended torque. Take a radiograph to confirm that the abutments are fully seated.



Making an impression of the prepared abutments

Block out the hex holes in the tops of the abutment screws with a medium of choice to prevent the ingress of impression material. Remove excess material so that the block-out is flush with the ends of the abutment screws. Make a conventional, full-arch, crown and bridge impression with an elastomeric impression material, such as vinyl polysiloxane. To insure a proper fit of the finished restoration, the abutments must remain in the patient's mouth after completing the impression procedure. Send the impression to the laboratory to fabricate a porcelain-fused-to-metal bridge.



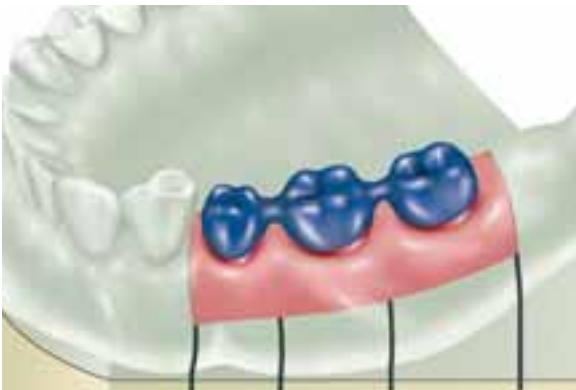
Cementing the provisional prosthesis

Block out the hex holes in the tops of the abutment screws with material of choice. If the laboratory has fabricated a provisional prosthesis, cement it onto the prepared abutments with soft-access cement. If a provisional prosthesis has not been fabricated, block out any undercuts and lightly lubricate the abutments. Fabricate a prosthesis over the abutments chairside with a light-cure or autopolymerizing tooth-colored acrylic material. For a more dense cure, remove the set provisional prosthesis from the mouth and place it in a curing unit. After curing, remove the restoration from the mold, trim and polish, then cement the finished provisional prosthesis onto the abutments.



Pouring the working cast

Pour the standard crown and bridge impression in die stone. An epoxy die material may be useful if preparations are extremely thin. Separate the cast from the impression. Follow standard laboratory procedures to produce a soft tissue model. Utilize the interocclusal records to articulate the working cast with the opposing-arch cast. Prepare the working cast to fabricate the wax framework pattern.



Fabricating the wax framework pattern

Create the wax framework pattern according to routine crown and bridge procedures.



Spruing, investing and casting the framework pattern

Attach 10-gauge sprue wax with reservoirs to the thickest part of each unit within the framework pattern. Add auxiliary sprues and vents to prevent porosity in the casting as needed.

Invest and cast the pattern in noble or high noble ceramic alloy according to the manufacturer's guidelines.



Finishing the cast framework

Divest the cast framework with ultrasonic cleaning and non-abrasive glass bead. Follow conventional laboratory techniques to fit and finish the cast framework. Seat the finished framework onto the working cast and confirm that a passive fit has been achieved. Place the framework on the working cast and send it to the clinician for a try-in of the metal framework. The dentist should confirm that a passive fit has been achieved before the veneering material is applied.



Trying in the finished framework

Remove the provisional restoration from the patient's mouth. Retorque the abutment screws to 30 Ncm with a calibrated torque wrench. Seat the finished framework onto the abutments. Verify that it fits passively, and that no additional finishing or adjustment is required. Remove the framework. Reseat the provisional prosthesis with soft-access cement.

Return the framework to the laboratory on the working cast for completion of the fixed partial denture.



Applying the porcelain (veneering material)

Prepare the framework to receive the opaque layer according to routine laboratory procedures.



Finishing the final prosthesis

Apply porcelain to the framework according to routine laboratory procedures.

Finish the porcelain and polish any metal margins, seat the finished prosthesis on the working cast and send it to the clinician for final delivery.



Delivering the final prosthesis

Remove the provisional restoration from the patient's mouth. Retorque the abutments to 30 Ncm with the calibrated torque wrench. Wait ten minutes, then retighten. This is done to compensate for clamping force lost due to screw embedment. Seal the screw access channel in each abutment with cotton pellets and light-curing resilient material or gutta-percha. This will ensure future access to the screw head. Seat the final prosthesis onto the abutments and confirm fit and contour. Check the occlusion. Verify that no additional finishing or adjustment is required. Cement the final prosthesis with a cement of choice. To facilitate future retrievability, a soft-access cement may be used. Provide the patient with oral hygiene instructions prior to release.