external
implant system

uncompromised strength,
proven success

BIOHORIZONS®

SCIENCE • INNOVATION • SERVICE

BIOHORIZONS®

99.2% average implant success rate[1]

BioHorizons is dedicated to developing evidence-based and scientifically proven products. From the launch of the External implant system (Maestro) in 1997, to the Laser-Lok 3.0 implant in 2010, dental professionals as well as patients have confidence in our comprehensive portfolio of dental implants and biologics products.

Our commitment to science, innovation and service has aided us in becoming one of the fastest growing companies in the dental industry. BioHorizons has helped restore smiles in 85 markets throughout Asia, North America, South America, Africa, Australia and Europe.

global leader for biologic based solutions

SCIENCE

BioHorizons uses science and innovation to create unique products with proven surgical and esthetic results.

INNOVATION

Our advanced implant technologies, biologic products and computer guided surgery software have made BioHorizons a leading dental implant company.

products sold in 85 markets

SERVICE

BioHorizons understands the importance of providing excellent service. Our global network of professional representatives and our highly trained customer care support team are well-equipped to meet the needs of patients and clinicians.

Table of Contents

Product Catalog

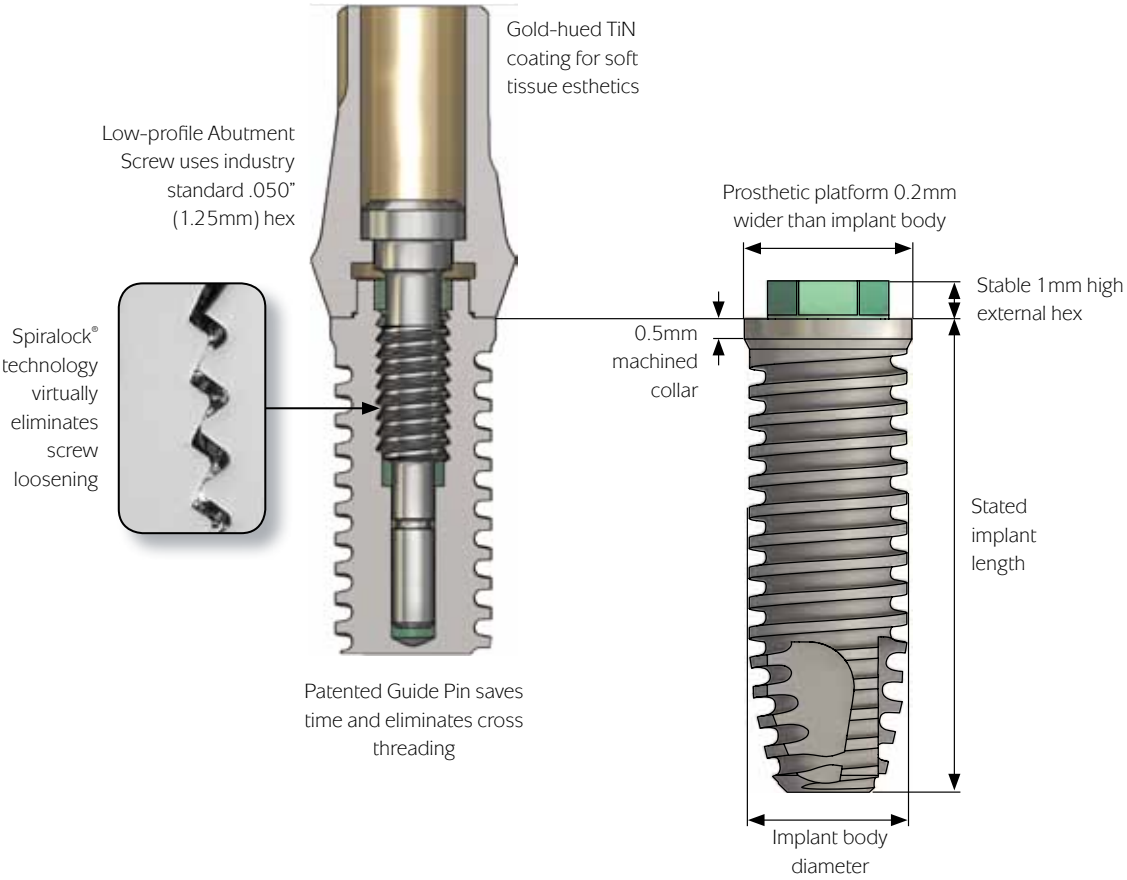
Surgical Manual

BIOHORIZONS®

external

Originally known as the Maestro, the External implant has performed masterfully in every published study since its launch in 1997. With success rates from 98.5% to 100% in studies of up to 1,400 implants in a wide variety of placement and loading conditions,[1] clinicians can confidently rely on the External to achieve consistent, reproducible results necessary to build a successful implantology practice.

- Transmits 10 times less destructive shear than conventional v-threads[2]
- Shown to achieve bone-to-implant contact levels of 80.6%[3]
- Higher reverse torque values than conventional v-thread implants[4]
- 4 platform/body diameters: 3.5mm, 4.0mm, 5.0mm, 6.0mm
- 5 lengths: 7mm, 9mm, 10.5mm, 12mm, 15mm



Crestal bone maintenance leads to success

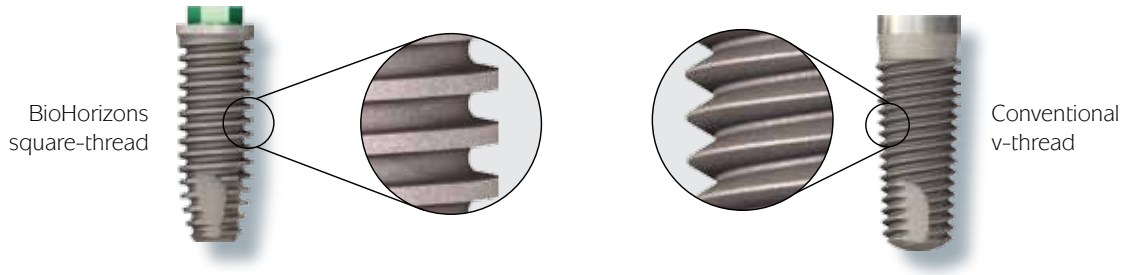
A prospective, multicenter trial showed a 5-year cumulative success rate of 99.5% for 495 External implants in 151 patients. There were no significant differences in the results by center, implant type, bone density, area of the mouth or prosthesis type. Crestal bone loss from prosthesis delivery to one-year follow-up was extremely low (0.06mm), and actually turned into bone gain at later follow-up intervals.[5]

Radiographs of External implants in function for more than 6 years. Note that the crestal bone levels are maintained above the level of the first thread. Courtesy of Dr. Carl E. Misch.

Increased surface area for immediate loading success

Bone is strongest in compressive loading; weakest in shear. External's square-thread design imparts 10 times less destructive stresses at the implant / bone interface than conventional v-thread designs, while maximizing compressive load transfer and providing excellent primary stability. These attributes have become increasingly important with the emergence of early and immediate load protocols.[6,7,8]

The square-thread design provides up to 154% greater surface area than conventional v-thread designs. A comparative study of thread designs (square-thread, v-thread and buttress thread) concluded that the square-thread design exhibited significantly higher reverse torque values and bone-to-implant contact than the other thread designs.[3]



Biomechanical thread form | Backed by science

External implants feature the time-proven, biomechanical square thread which has been demonstrated to provide **increased bone-to-implant contact and yield higher reverse-torque values**.

	V-thread	Modified-square
Reverse Torque Value (Ncm)	15.58 ± 6.07	23.17 ± 9.68
% Bone-to-Implant Contact	65.46 ± 9.64	74.37 ± 8.63

Steigenga J, Al-Shammari K, Misch C, Nociti F and Wang H-L. *Effects of Implant Thread Geometry on Percentage of Osseointegration and Resistance to Reverse Torque in the Tibia of Rabbits.* J Periodontology 2004;75:1233-1241

Multiple studies have demonstrated the BioHorizons square thread to be extremely reliable in immediate loading protocols. One study, summarized below, followed 242 BioHorizons implants through immediate functional and non-functional loading.

BioHorizons Implants	N Implants	N Failures	% Implant Survival	% Prostheses Survival
Immediate Functional Loading	126	0	100%	100%
Immediate Non-Functional Loading	116	0	100%	100%

Degidi and Piattelli. *Immediate Functional and Non-Functional Loading of Dental Implants: A 2- to 60-Month Follow-Up Study of 646 Titanium Implants.* J Periodontology 2003;74:225-241.

Resorbable Blast Texturing (RBT) Roughened TiO_2 surface		Diameter x Length		Hydroxylapatite Coating (HA) High-density crystalline coating
	3507D3*	3.5mm x 7mm	NA	
	3509D3	3.5mm x 9mm	NA	
	35105D3	3.5mm x 10.5mm	NA	
	3512D3	3.5mm x 12mm	NA	
	3515D3	3.5mm x 15mm	NA	
	4007D3*	4.0mm x 7mm	4007D4*	
	4009D3	4.0mm x 9mm	4009D4	
	40105D3	4.0mm x 10.5mm	40105D4	
	4012D3	4.0mm x 12mm	4012D4	
	4015D3	4.0mm x 15mm	4015D4	
	5007D3*	5.0mm x 7mm	5007D4*	
	5009D3	5.0mm x 9mm	5009D4	
	50105D3	5.0mm x 10.5mm	50105D4	
	5012D3	5.0mm x 12mm	5012D4	
	5015D3	5.0mm x 15mm	5015D4	
	6007D3*	6.0mm x 7mm	6007D4*	
	6009D3	6.0mm x 9mm	6009D4	
	60105D3	6.0mm x 10.5mm	60105D4	
	6012D3	6.0mm x 12mm	6012D4	
	6015D3	6.0mm x 15mm	6015D4	

	Body Diameter	Platform Diameter	Apical Diameter	Hex flat-to-flat measure	Machined Collar Height	Minimum Ridge Width	Minimum Mesial/ Distal Space
3.5mm Implants	3.5mm	3.7mm	2.0mm	2.4mm	0.5mm	5.5mm	6.5mm
4.0mm Implants	4.0mm	4.2mm	2.1mm	2.7mm	0.5mm	6.0mm	7.0mm
5.0mm Implants	5.0mm	5.2mm	2.5mm	3.0mm	0.5mm	7.0mm	8.0mm
6.0mm Implants	6.0mm	6.2mm	3.5mm	3.0mm	0.5mm	8.0mm	9.0mm

Please refer to the External -7mm Length Implants manual (ref. L0151) for detailed instructions for use of the prosthetic components for 7mm implants.

**Each 7mm implant comes packaged with the* 3inOne *Abutment, a short cover screw and a short Abutment Screw.*

HEALING ABUTMENTS & COVER SCREWS

Healing Abutments

Use for tissue healing at second-stage uncovery or as a transmucosal element for single-stage procedures. Color-coded by implant diameter. Hand-tighten with the .050" (1.25mm) Hex Driver. Titanium Alloy.

Flared Emergence	Implant Diameter x Height	Straight Emergence
212-303	3.5mm x 3mm	204-303
212-304	3.5mm x 4.5mm	204-304
212-306	3.5mm x 6mm	204-306
212-403	4.0mm x 3mm	204-403
212-404	4.0mm x 4.5mm	204-404
212-406	4.0mm x 6mm	204-406
212-503	5.0mm x 3mm	204-503
212-504	5.0mm x 4.5mm	204-504
212-506	5.0mm x 6mm	204-506
212-603	6.0mm x 3mm	204-603
212-604	6.0mm x 4.5mm	204-604
212-606	6.0mm x 6mm	204-606








Cover Screws

Packaged with each implant. Protects the implant's prosthetic platform during submerged surgical healing. Color-coded by implant diameter. Hand-tighten with the .050" (1.25mm) Hex Driver. Titanium Alloy.

103-900	3.5mm Cover Screw
104-900	4.0mm Cover Screw
105-900	5.0mm Cover Screw
106-900	6.0mm Cover Screw

103-700	3.5mm Short Cover Screw *(for 7mm length implants)*
104-700	4.0mm Short Cover Screw *(for 7mm length implants)*
105-700	5.0mm Short Cover Screw *(for 7mm length implants)*
106-700	6.0mm Short Cover Screw *(for 7mm length implants)*

products shown not to scale

External Surgical Kit

160-500

External Surgical Kit
Includes all instruments (except 122-12507) shown on pages 6-7.

160-200

Surgical Tray & Lid (without instruments)

Individual Surgical Kit Components

122-103
2.0mm Starter Drill

122-100
Drill Extender

144-100 **Straight Parallel Pins** (4 per kit)
144-200 **20° Angled Parallel Pins** (2 per kit)

122-12507	**2.5 x 7mm Depth Drill** (sold separately)
122-12509	**2.5 x 9mm Depth Drill**
122-125105	**2.5 x 10.5mm Depth Drill**
122-12512	**2.5 x 12mm Depth Drill**
122-12515	**2.5 x 15mm Depth Drill**
122-225	**2.5mm Depth Drill** (without Depth Stop)

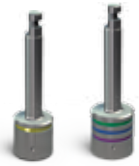
122-230	**3.0mm Width Increasing Drill**
122-232	**3.4mm Width Increasing Drill**
122-237	**3.9mm Width Increasing Drill**
122-242	**4.4mm Width Increasing Drill**
122-247	**4.9mm Width Increasing Drill**
122-252	**5.4mm Width Increasing Drill**

products shown not to scale

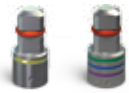
Individual Surgical Kit Components

123-000 3.5mm Crestal Bone Drill
124-000 4.0mm Crestal Bone Drill
125-000 5.0mm Crestal Bone Drill
126-000 6.0mm Crestal Bone Drill

123-300 3.5mm Bone Tap
124-300 4.0mm Bone Tap
125-300 5.0mm Bone Tap
126-300 6.0mm Bone Tap



133-100 3.5mm Handpiece Adapter
145-100 4.0/5.0/6.0mm Handpiece Adapter



303-200 3.5mm Ratchet Adapter*
345-200 4.0/5.0/6.0mm Ratchet Adapter*

153-000 3.5mm Implant-level Insertion Tool*
154-000 4.0mm Implant-level Insertion Tool*
155-000 5.0/6.0mm Implant-level Insertion Tool*

135-351

.050" (1.25mm) Hex Driver

130-000

Ratchet

300-400

Hand Wrench

300-206

4mm Square Drive Extender*

Replaced 300-205 starting in June 2010. Includes PEEK C-ring for durable retention in Ratchet. Cannot be used with bone taps.

144-300

Implant Spacer / Depth Probe

**instrument o-rings & c-rings wear out over time. If an instrument is no longer held securely by its associated driver, order a replacement ring through Customer Care.*

products shown not to scale

Extended Shank Drills *(not included in Surgical Kit)*

Extended Shank Drills are 8mm longer than our standard drills. They provide an intermediary increase in length between the standard drills used alone, or with the Drill Extender (ref. 122-100), which adds 16mm of length. The depth marks and cutting geometry are identical to our standard drills.

122-403	**2.0mm Starter Drill, Extended Shank**
122-42507	**2.5 x 7mm Depth Drill, Extended Shank**
122-42509	**2.5 x 9mm Depth Drill, Extended Shank**
122-425105	**2.5 x 10.5mm Depth Drill, Extended Shank**
122-42512	**2.5 x 12mm Depth Drill, Extended Shank**
122-42515	**2.5 x 15mm Depth Drill, Extended Shank**
122-425	**2.5mm Depth Drill, Extended Shank**

122-430	**3.0mm Width Increasing Drill, Extended Shank**
122-432	**3.4mm Width Increasing Drill, Extended Shank**
122-437	**3.9mm Width Increasing Drill, Extended Shank**
122-442	**4.4mm Width Increasing Drill, Extended Shank**
122-447	**4.9mm Width Increasing Drill, Extended Shank**
122-452	**5.4mm Width Increasing Drill, Extended Shank**

Ratchet & Hand Wrench Extender

300-205 **Ratchet & Hand Wrench Extender**

Can be used with Bone Taps (page 7).

Surgical Driver

150-000 **Surgical Driver**

Use to drive implants into the osteotomy, particularly in the anterior region. The driver holds the Abutment-level Driver, Ratchet which interfaces with the 3inOne Abutment. Also interfaces with the .050" (1.25mm) Hex Drivers as well as Bone Taps and the Implant-level Drivers, Ratchet.

products shown not to scale

Ancillary Instruments *(not included in Surgical Kit)*

122-110 **2.0mm Lindemann Bone Cutter**

Side-cutting drill used to correct eccentric osteotomy preparations.

PYTP **3.5mm Tissue Punch**

122-201 **4.0mm Tissue Punch**

122-202 **5.0mm Tissue Punch**

122-203 **6.0mm Tissue Punch**

BioHorizons Tissue Punches are used in a latch-type handpiece to remove the soft tissue from the crest of the ridge prior to osteotomy preparation in a flapless surgical procedure.

122-113 **External Bone Profiler, 3.5mm**

122-114 **External Bone Profiler, 4.0mm**

122-115 **External Bone Profiler, 5.0mm**

122-116 **External Bone Profiler, 6.0mm**

Use at implant uncovery to contour crestal bone to accommodate abutments when the implant is subcrestal. For use in latch-type reduction handpieces. The Profiler's internal geometry matches the geometry of the surgical Cover Screw which aligns the Profiler for precise removal of tissue surrounding the platform.

134-350 **.050" (1.25mm) Handpiece Hex Driver**

134-450 **.050" (1.25mm) Handpiece Hex Driver, Long**

For installation and removal of Cover Screws, Healing Abutments and Abutment Screws. Use with latch-type contra-angle handpieces: WS-75 E/KM or similar. 134-450 is 5mm longer than the 134-350.

Adjustable Torque Wrenches

ATW **ITL Precise Adjustable Torque Wrench**

Ratchet design places both implants and abutments with 9 distinct torque settings (15, 20, 25, 30, 35, 40, 45, 50 and 60 Ncm). A simple twist of the handle locks in precision-engineered torque values and guarantees accuracy and repeatability. Use with 4mm square drivers.

EL-C12374 **Elos Adjustable Torque Wrench**

Lightweight titanium design is easy to use as an adjustable torque wrench or a ratchet. Quickly disassembles for cleaning. No calibration required. Use with 4mm square drivers.

products shown not to scale

Marketing Collateral

L0151

External - 7mm Length Implants
Guides the clinician and laboratory through the nuances of placing and restoring BioHorizons External 7mm length implants. Includes ordering information for implants, 2.0 x 7mm Depth Drills and Radiographic Templates with 7mm length implants.
NOTE: 7mm length implants are not available in all countries; please call for availability in your market.

ML0103 **Patient Education – Tooth replacement with dental implants**

ML0114 **Patient Education – Stabilizing dentures using dental implants**

ML0129 **Patient Education – Rebuilding and maintaining bone**

MLD101 **Patient Education – Soft tissue grafting with AlloDerm®**

ML0131

Patient Education – Dental Implants - the tooth replacement solution
This high-quality flipbook helps the implant candidate understand the rationale and the advantages of implant therapy compared to traditional treatment methods. 9" x 6" (23cm x 16cm).

MPSA

Five Implant Acrylic Model
This life-sized model allows the clinician to illustrate implant placement of BioHorizons implants. Clear acrylic allows the implants to be viewed in relation to adjacent teeth. Call for availability.

EP-MSLA

Locator Patient Education Model
This life-sized model allows the clinician to illustrate a denture on an edentulous mandible supported by 2 implants with Locator abutments. Clear acrylic allows the implants to be viewed in relation to the denture. Call for availability.

ML0207

External Impression Technique Guide
Guides the clinician and laboratory through impression making techniques and procedures with BioHorizons External impression components.

products shown not to scale

W&H Motor Kits

Motor Kits include: console, handheld motor with cable, foot pedal,
(3) disposable irrigation tubes, handpiece, bur testing gauge, service oil, and oil spray cap.

WH-310L — **Elcomed SA-310 Professional Kit with LED**
Includes LED handpiece (WH-10207530).

WH-310 — **Elcomed SA-310 Professional Kit**
Includes handpiece (WH-10207510).

WH-915L — **Implantmed SI-915 Starter Kit with LED**
Includes mono block LED handpiece (WH-10207560).

WH-915 — **Implantmed SI-915 Starter Kit**
Includes mono block handpiece (WH-10207550).

Surgical Handpieces & Prosthodontic Screwdriver

WH-00001100	**S-11 Surgical Handpiece 1:1 Straight**
WH-00001101	**SL-11 Surgical Handpiece 1:1 Straight, Long**
WH-00001120	**SI-11 LED G Surgical Handpiece 1:1 Straight, Mono Block**
WH-00001130	**S-11 LED G Surgical Handpiece 1:1 Straight**
WH-10100900	**S-9 Surgical Handpiece 1:1 Angled**
WH-10101000	**S-10 Surgical Handpiece 1:1 Angled, Slim**
WH-10101200	**S-12 Surgical Handpiece 1:2 Angled, Slim**
WH-10205601	**WS-56 E Surgical Handpiece 1:1 Contra-Angle**
WH-10207510	**WS-75 E/KM Surgical Handpiece 20:1 Contra-Angle**
WH-10207530	**WS-75 E/KM LED G Surgical Handpiece 20:1 Contra-Angle**
WH-10207550	**WI-75 E/KM Surgical Handpiece 20:1 Contra-Angle, Mono Block**
WH-10207560	**WI-75 E/KM LED G Surgical Handpiece 20:1 Contra-Angle, Mono Block**
WH-10209201	**WS-92 E/3 Surgical Handpiece 1:2.7 Contra-Angle**
WH-12227901	**EB-79 ENDO NiTi Handpiece 2:1 Contra-Angle**
WH-16934000	**IA-400 Prosthodontic Screwdriver**

W&H Elcomed and Implantmed Re-Order Items

WH-04363600	**Disposable Irrigation Tubing, 2.2m (Implantmed and Elcomed SA-310) (box of 6)**
WH-06338400	**Irrigation Spike w/ Roller Clamp**
WH-04757100	**Irrigation Spray Clip for External and Internal Irrigation (set of 3)**
WH-10940011	**MD-400 Service-Oil F1**
WH-04013900	**Pump Tube Complete (Implantmed and Elcomed SA-310)**
WH-06338500	**Spare Irrigation Tube for Spike**
WH-00929300	**Spray Tubes (box of 10)**
WH-04019000	**Tube Clamps (Implantmed) (set of 5)**
WH-02139800	**Bur Testing Gauge**

products shown not to scale

Ceramic Abutments for Esthetic Zone Restorations

223-315 **3.5mm Ceramic Abutment**

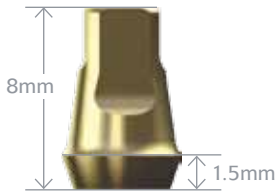
224-315 **4.0mm Ceramic Abutment**

225-315 **5.0mm Ceramic Abutment**

226-315 **6.0mm Ceramic Abutment**

Use to fabricate cement-retained, single- or multiple-unit prostheses. Packaged with an abutment screw (130-400 or 140-400 used only with External Ceramic Abutments). Yttria-stabilized Zirconia. Final torque: 30Ncm.

3inOne Abutments for Cement-retained Restorations



203-311 **3.5mm 3inOne Abutment**

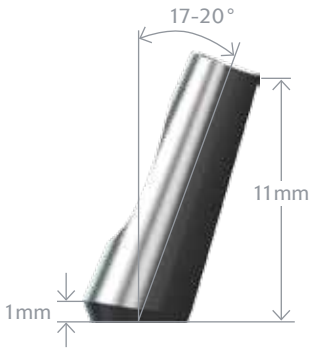
204-411 **4.0mm 3inOne Abutment**

205-511 **5.0mm 3inOne Abutment**

206-611 **6.0mm 3inOne Abutment**

Use to fabricate cement-retained, single- or multiple-unit prostheses. Also use with a Ball-top Screw as a closed-tray, hexed-timed impression coping. Packaged with an abutment screw (130-300 or 140-300). Titanium Alloy. TiN coated. Final torque: 30Ncm.

Angled Abutments for Cement-retained Restorations



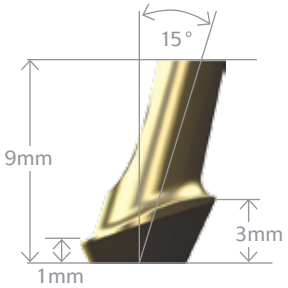
213-400 **3.5mm Angled Abutment (17°)**

214-400 **4.0mm Angled Abutment (20°)**

215-400 **5.0mm Angled Abutment (20°)**

Use to fabricate cement-retained, single- or multiple-unit prostheses. Packaged with an abutment screw (130-300 or 140-300). Titanium Alloy. Final torque: 30Ncm.

Angled Esthetic Abutments for Cement-retained Restorations



223-313 **3.5mm Angled Esthetic Abutment**

224-313 **4.0mm Angled Esthetic Abutment**

225-313 **5.0mm Angled Esthetic Abutment**

Use to fabricate cement-retained, single- or multiple-unit prostheses. Packaged with an abutment screw (130-300 or 140-300). Titanium Alloy. TiN coated. Final torque: 30Ncm.

If a 6.0mm abutment is not available, the 5.0mm abutment may be used.

products shown not to scale

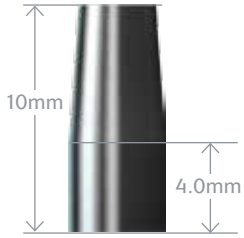
Straight Abutments for Cement-retained Restorations

233-410 **3.5mm Straight Abutment**

234-410 **4.0mm Straight Abutment**

235-410 **5.0mm Straight Abutment**

Use to fabricate cement-retained, single- or multiple-unit prostheses. Packaged with an abutment screw (130-300 or 140-300). Titanium Alloy. Final torque: 30Ncm.



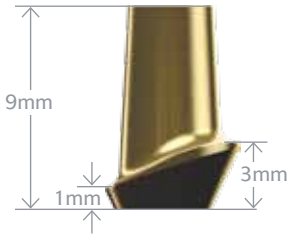
Straight Esthetic Abutments for Cement-retained Restorations

223-314 **3.5mm Straight Esthetic Abutment**

224-314 **4.0mm Straight Esthetic Abutment**

225-314 **5.0mm Straight Esthetic Abutment**

Use to fabricate cement-retained, single- or multiple-unit prostheses. Packaged with an abutment screw (130-300 or 140-300). Titanium Alloy. TiN coated. Final torque: 30Ncm.



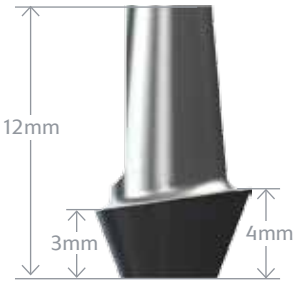
Profile Abutments for Cement-retained Restorations

223-312 **3.5mm Profile Abutment**

224-312 **4.0mm Profile Abutment**

225-312 **5.0mm Profile Abutment**

Use to fabricate cement-retained, single- or multiple-unit prostheses. Packaged with an abutment screw (130-300 or 140-300). Titanium Alloy. Final torque: 30Ncm.



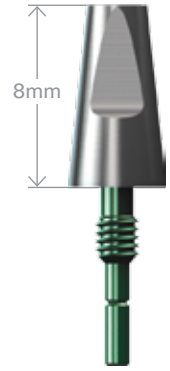
Abutments for Cement-retained Restorations - Non-hexed

223-208 **3.5mm Abutment for Cement, Non-hexed**

224-208 **4.0mm Abutment for Cement, Non-hexed**

225-208 **5.0mm Abutment for Cement, Non-hexed**

Use to fabricate cement-retained, multiple-unit prostheses. One-piece, non-hex engaging abutment. Titanium Alloy. Final torque: 30Ncm.
Note: Must be prepped chairside followed by a conventional crown and bridge impression.



If a 6.0mm abutment is not available, the 5.0mm abutment may be used.

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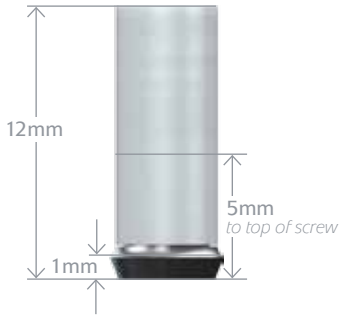
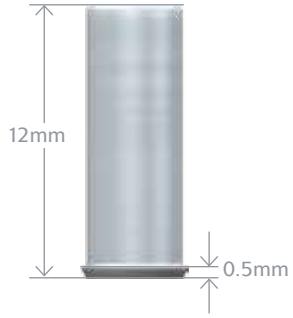
Custom Castable (UCLA) Abutments - Hexed



233-227 **3.5mm Gold/Plastic Custom Castable Abutment, Hexed**
234-227 **4.0mm Gold/Plastic Custom Castable Abutment, Hexed**
235-227 **5.0mm Gold/Plastic Custom Castable Abutment, Hexed**
236-227 **6.0mm Gold/Plastic Custom Castable Abutment, Hexed**

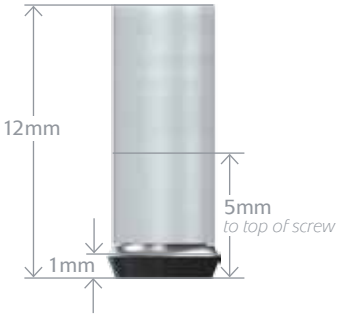
Use for single-unit screw-retained or custom abutment cement-retained restorations. Packaged with an abutment screw (130-300 or 140-300). Gold Alloy base with natural acetyl (Delrin® or Pomalux®) sleeve. Final torque: 30Ncm.



233-217 **3.5mm Plastic Custom Castable Abutment, Hexed**
234-217 **4.0mm Plastic Custom Castable Abutment, Hexed**
235-217 **5.0mm Plastic Custom Castable Abutment, Hexed**
236-217 **6.0mm Plastic Custom Castable Abutment, Hexed**

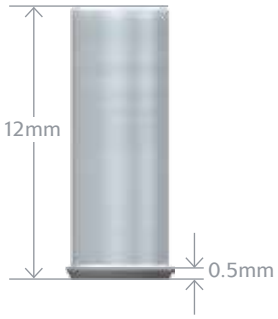
Use for multiple-unit, screw-retained restorations.Packaged with an abutment screw (130-300 or 140-300). Natural acetyl (Delrin® or Pomalux®) sleeve. Final torque: 30Ncm.

Custom Castable (UCLA) Abutments - Non-hexed



233-228 **3.5mm Gold/Plastic Custom Castable Abutment, Non-hexed**
234-228 **4.0mm Gold/Plastic Custom Castable Abutment, Non-hexed**
235-228 **5.0mm Gold/Plastic Custom Castable Abutment, Non-hexed**
236-228 **6.0mm Gold/Plastic Custom Castable Abutment, Non-hexed**

Use for single-unit screw-retained or custom abutment cement-retained restorations. Packaged with an abutment screw (130-300 or 140-300). Gold Alloy base with natural acetyl (Delrin® or Pomalux®) sleeve. Final torque: 30Ncm.



233-210 **3.5mm Plastic Custom Castable Abutment, Non-hexed**
234-210 **4.0mm Plastic Custom Castable Abutment, Non-hexed**
235-210 **5.0mm Plastic Custom Castable Abutment, Non-hexed**
236-210 **6.0mm Plastic Custom Castable Abutment, Non-hexed**

Use for multiple-unit, screw-retained restorations. Packaged with an abutment screw (130-300 or 140-300). Natural acetyl (Delrin® or Pomalux®) sleeve. Final torque: 30Ncm.

products shown not to scale

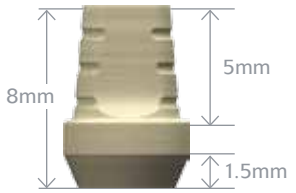
PEEK Temporary Abutments

273-000 **3.5mm PEEK Temporary Abutment**

274-000 **4.0mm PEEK Temporary Abutment**

275-000 **5.0mm PEEK Temporary Abutment**

276-000 **6.0mm PEEK Temporary Abutment**



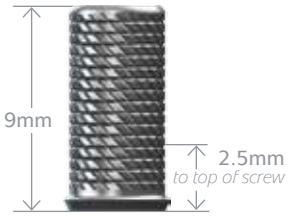
Use for fabrication of cement- or screw-retained provisional restorations (up to 30 days). A direct coping screw (243-320 or 244-320, purchased separately) may be used to maintain screw access hole during fabrication of screw-retained provisional prostheses. Packaged with an abutment screw (130-300 or 140-300). PEEK (PolyEtherEtherKetone) material. Final torque: 30Ncm.

Titanium Temporary Abutments - Hexed

233-215 **3.5mm Titanium Temporary Abutment, Hexed**

234-215 **4.0mm Titanium Temporary Abutment, Hexed**

235-215 **5.0mm Titanium Temporary Abutment, Hexed**



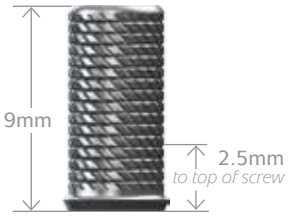
Use for single-unit screw-retained, long term temporary restorations (>30 days). Packaged with an abutment screw (130-300 or 140-300).Titanium Alloy. Final torque: 30Ncm.

Titanium Temporary Abutments - Non-hexed

233-214 **3.5mm Titanium Temporary Abutment, Non-hexed**

234-214 **4.0mm Titanium Temporary Abutment, Non-hexed**

235-214 **5.0mm Titanium Temporary Abutment, Non-hexed**



Use for multiple-unit, screw-retained, long term temporary restorations (>30 days). Packaged with an abutment screw (130-300 or 140-300).Titanium Alloy. Final torque: 30Ncm.

Ball-top Screw for Indirect Transfer

213-235 **3.5mm Ball-top Screw**

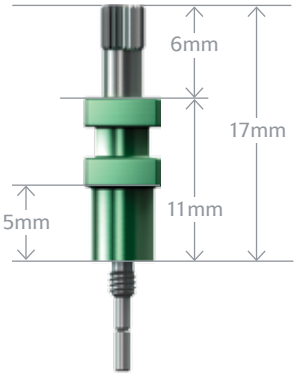
214-235 **4.0/5.0/6.0mm Ball-top Screw**

Use with the 3inOne Abutment to form an impression coping for closed-tray, hexed-timed transfers. Hand-tighten. Titanium Alloy.

If a 6.0mm abutment is not available, the 5.0mm abutment may be used.

products shown not to scale

Direct Pick-up Copings (Open Tray) - Hexed



243-331 **3.5mm Direct Pick-up Coping, Hexed**

244-331 **4.0mm Direct Pick-up Coping, Hexed**

245-331 **5.0mm Direct Pick-up Coping, Hexed**

246-331 **6.0mm Direct Pick-up Coping, Hexed**

Use to make an open-tray, implant-level, hexed-timed impression. Packaged with an extended direct coping screw (243-320 or 244-320). Titanium Alloy. Hand-tighten.

Direct Pick-up Copings (Open Tray) - Non-hexed

243-321 **3.5mm Direct Pick-up Coping, Non-hexed**

244-321 **4.0mm Direct Pick-up Coping, Non-hexed**

245-321 **5.0mm Direct Pick-up Coping, Non-hexed**

246-321 **6.0mm Direct Pick-up Coping, Non-hexed**

Use to make an open-tray, implant-level, non-hexed impression. Packaged with an extended direct coping screw (243-320 or 244-320). Titanium Alloy. Hand-tighten.

Implant Analogs

293-000 **3.5mm Implant Analog**

294-000 **4.0mm Implant Analog**

295-000 **5.0mm Implant Analog**

296-000 **6.0mm Implant Analog**

Use in lab to represent the implant in the working cast. Color-coded by implant body diameter. Titanium Alloy.

products shown not to scale

Direct Coping Screws

243-320 **3.5mm Direct Pick-up Screw**

244-320 **4.0/5.0/6.0mm Direct Pick-up Screw**

Packaged with all direct pick-up copings. May also be used in place of an abutment screw when extra length is needed, or to maintain the screw access hole during fabrication of screw-retained provisional prostheses. Up to 7mm can be removed from the screw without losing the hex engagement. Utilizes the .050" (1.25mm) Hex Driver. Hand-tighten or torque to 30 Ncm depending on application. Titanium Alloy.

Abutment Screws

130-300 **3.5mm Abutment Screw**

140-300 **4.0/5.0/6.0mm Abutment Screw**

Low profile screw head. Packaged with all two-piece abutments. Utilizes the .050" (1.25mm) Hex Driver. Final torque: 30 Ncm. Titanium Alloy.

Abutment Screws for 7mm length implants

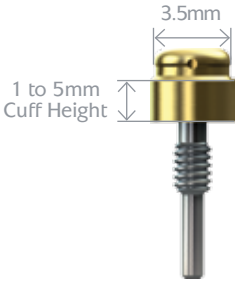
130-050 **3.5mm Short Abutment Screw, for 7mm**

140-050 **4/5/6mm Short Abutment Screw, for 7mm**

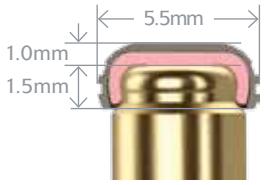
Specifically designed for and packaged with each 7mm length External implant. May be used with all restorative components *in lieu* of the regular abutment screw. Utilizes .050" (1.25mm) Hex Driver. Titanium Alloy.

products shown not to scale

Locator® Abutments



LA-8531	**3.5mm Locator Abutment, 1.25mm Cuff Height**
LA-8532	**3.5mm Locator Abutment, 2.0mm Cuff Height**
LA-8533	**3.5mm Locator Abutment, 3.0mm Cuff Height**
LA-8534	**3.5mm Locator Abutment, 4.0mm Cuff Height**
LA-8535	**3.5mm Locator Abutment, 5.0mm Cuff Height**
LA-8541	**4.0mm Locator Abutment, 1.0mm Cuff Height**
LA-8542	**4.0mm Locator Abutment, 2.0mm Cuff Height**
LA-8543	**4.0mm Locator Abutment, 3.0mm Cuff Height**
LA-8544	**4.0mm Locator Abutment, 4.0mm Cuff Height**
LA-8545	**4.0mm Locator Abutment, 5.0mm Cuff Height**



LA-8551	**5.0mm Locator Abutment, 1.5mm Cuff Height**
LA-8552	**5.0mm Locator Abutment, 2.5mm Cuff Height**
LA-8553	**5.0mm Locator Abutment, 3.5mm Cuff Height**
LA-8554	**5.0mm Locator Abutment, 4.5mm Cuff Height**
LA-8555	**5.0mm Locator Abutment, 5.5mm Cuff Height**

The Locator Implant Attachments are designed for use with overdentures or partial dentures retained in whole or in part by dental implants in the mandible or maxilla. Order by Cuff Height to match the height of the gingival tissue. The abutment will extend above the tissue by 1.5mm to allow the Locator Male to seat completely. Order one Locator Male Processing Set for each Locator Abutment (sold in packs of 2 or 10). Titanium Alloy.

The Male Processing Package provides 3 choices of retention. The Replacement Males (clear, pink and blue) are used to restore implants with up to 10° of divergence (20° between implants). The Extended Range Replacement Males (green and red) accommodate divergences from 10° and 20° (40° between implants), and may be purchased separately.

Locator Components

LCT

Core Tool
Multi-purpose tool serves as hand driver for seating Locator Abutments onto the implants, seating tool for nylon male inserts and insert removal tool.

LMPP-2

Locator Male Processing Package (2 pack)
Includes: (2) Denture Caps with (2) Black Processing Males; (2) White Block-out Spacers; (2) Clear, (2) Pink and (2) Blue Nylon Males.

LMPP-10

Locator Male Processing Package (10 pack)
Includes: (10) Denture Caps with (10) Black Processing Males; (10) White Block-out Spacers; (10) Clear, (10) Pink and (10) Blue Nylon Males.

products shown not to scale

LOCATOR ABUTMENT COMPONENTS

Locator Impression Coping

LIC	**Locator Impression Coping (4 pack)**

Locator Female Analog

LFA-4MM	**Locator Female Analog 4mm (4 pack)** Use for 3.5/4.0 platform
LFA-5MM	**Locator Female Analog 5mm (4 pack)** Use for 5.0 and 6.0 platform

Locator Male Replacements

LRM-C	**Locator Replacement Male (clear) (4 pack)** Retention: 5lb / 2268g
LRM-P	**Locator Light Retention Replacement Male (pink) (4 pack)** Retention: 3lb / 1361g
LRM-B	**Locator Extra Light Retention Replacement Male (blue) (4 pack)** Retention: 1.5lb / 680g
LRM-G	**Locator Extended Range Replacement Male (green) (4 pack)** Retention: 3-4lbs / 1361-1814g
LRM-R	**Locator Extended Range Extra Light Retention Rep. Male (red) (4 pack)** Retention: 1.5lbs / 680g
LBPRM	**Locator Black Processing Replacement Male (4 pack)**

Locator Parallel Post

LPP	**Locator Parallel Post (4 pack)**

Locator Measurement Guide

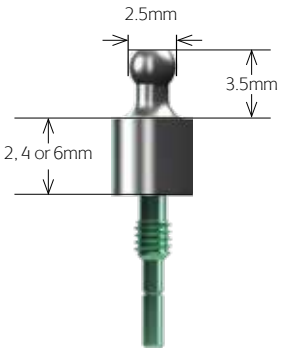
LAMG	**Locator Angle Measurement Guide**

Locator Square Drive Tool

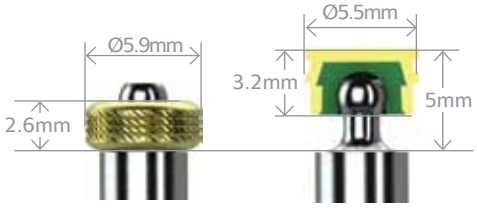
LSDT-15MM	**Locator Square Drive Tool (15mm)** Use with a torque wrench to seat Locator Abutments. 15mm in length.
LSDT-21MM	**Locator Square Drive Tool (21mm)** Use with a torque wrench to seat Locator Abutments. 21mm in length.

products shown not to scale

Ball Abutments



263-002	**3.5mm Ball Abutment, 2mm Collar**
263-004	**3.5mm Ball Abutment, 4mm Collar**
263-006	**3.5mm Ball Abutment, 6mm Collar**
264-002	**4.0mm Ball Abutment, 2mm Collar**
264-004	**4.0mm Ball Abutment, 4mm Collar**
264-006	**4.0mm Ball Abutment, 6mm Collar**
265-002	**5.0mm Ball Abutment, 2mm Collar**
265-004	**5.0mm Ball Abutment, 4mm Collar**
265-006	**5.0mm Ball Abutment, 6mm Collar**



Sizing comparison of O-ring Attachment and Ball Attachment

Use for retention of tissue-supported overdentures. Ball Abutments may be used for indirect transfer impressions. Ball Abutment Analogs on facing page are used for producing a working cast. Titanium Alloy.

O-ring Attachment Set

260-100 **O-ring Attachment Set**

Standard O-ring attachment for processing into denture. Includes: (1) O-ring encapsulator, (2) Processing O-rings and (2) Clinical O-rings. Recommended for relatively parallel implants (5° of divergence or 10° between implants).

O-ring Individual Components

260-300 **O-ring Encapsulator**
Female receptacle processed into denture. Titanium. 2 per package.

260-220 **Processing O-ring**
Use for lab processing applications. Buna. 12 per package.

260-210 **Clinical O-ring**
Use for clinical applications. Silicone. 12 per package.

products shown not to scale

Ball Attachment Set

BCAS **Ball Attachment Set**

Includes: (1) Titanium Housing, (3) Female Nylon Inserts - white (more retention), pink (less retention), black (lab processing) and (1) Protective Disk (ref. BCPD, protects tissue during impression making or denture pick-up)

The Ball Attachment system offers several advantages over traditional O-ring attachments:
- Greater abutment angulation (14° of divergence or 28° between implants)
- 0.4mm of less mesial/distal/buccal/lingual space
- Four different levels of retention instead of one

Ball Abutment Components

BCAHT **Attachment Housings - Titanium**
For Resin pickup or Soldering.
2 per package.

BCIB **Black Nylon Insert**
Lab Processing and Chair-side Denture Pick-up. 2 per package.

BCIG **Green Nylon Insert**
Clinical use. 2 per package.
Elastic Retention.

BCIST **Insert Seating Tool**
Use to seat nylon inserts in attachment housings.

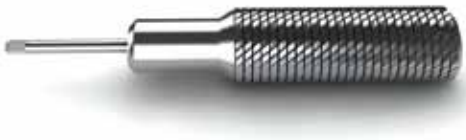
BCIY **Yellow Nylon Insert**
Clinical use. 2 per package.
Extra Soft Retention: 500-550g

BCIP **Pink Nylon Insert**
Clinical use. 2 per package.
Soft Retention: 800-950g

BCIW **White Nylon Insert**
Clinical use. 2 per package.
Standard Retention: 1200-1300g

BCDR **Directional Rings**
Use for obtaining parallelism.
0°, 7° and 14° rings. Set of 3.

BCR **Reamer**
Use to adjust retention of nylon inserts.



Ball Abutment Analogs

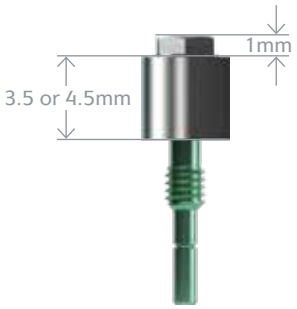
260-400 **3.5/4.0mm Ball Abutment Analog (2 pack)**

260-500 **5.0mm Ball Abutment Analog (2 pack)**

Use to represent the Ball Abutment/Implant assembly in the working cast. Only use in conjunction with Ball Abutments. Titanium Alloy.

products shown not to scale

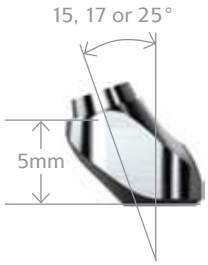
Abutment for Screw - Non-hexed



AFS353	**3.5mm Abutment for Screw, 3.5mm collar**
AFS354	**3.5mm Abutment for Screw, 4.5mm collar**
AFS403	**4.0mm Abutment for Screw, 3.5mm collar**
AFS404	**4.0mm Abutment for Screw, 4.5mm collar**
AFS503	**5.0mm Abutment for Screw, 3.5mm collar**
AFS504	**5.0mm Abutment for Screw, 4.5mm collar**

Use for multiple-unit restorations including: screw-retained restorations at the abutment level, cast alloy bars for overdentures and fixed/detachable (hybrid) restorations. Comes packaged with the Cover Cap (PXABCC). Titanium Alloy.

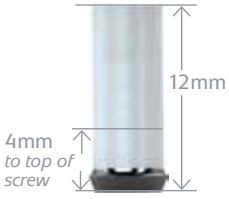
Angled Abutment , Abutment for Screw - Hexed



AFS355-17	**3.5mm Angled Abutment for Screw, 17 Degree**
AFS405-15	**4.0mm Angled Abutment for Screw, 15 Degree**
AFS405-25	**4.0mm Angled Abutment for Screw, 25 Degree**
AFS505-15	**5.0mm Angled Abutment for Screw, 15 Degree**

Comes packaged with the Cover Cap (PXABCC) and Abutment Screw (130-300 or 140-300). Final torque: 30Ncm. Titanium Alloy.

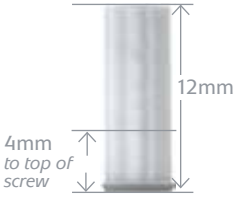
Gold & Plastic Copings, Abutment for Screw - Non-hexed



PXABGC

Gold Coping, Abutment for Screw

May be trimmed for height. Packaged with one Screw (regular), Abutment for Screw (see PXABS). Gold Alloy base with natural acetyl (Delrin® or Pomalux®).



PXABPC

Plastic Coping, Abutment for Screw

May be trimmed for height. Packaged with one Screw (regular), Abutment for Screw (see PXABS). Natural acetyl (Delrin® or Pomalux®).

Instant Fixed Overdenture Abutment - Non-hexed

PXIFO

Instant Fixed Overdenture Abutment

Use with Abutments for Screw for fabrication of immediate provisional overdentures. See Fixed Provisional Overdenture Technique (L0155) for more details. Packaged with one Screw (regular), Abutment for Screw (see PXABS). Abutment height is 9mm. Final torque: 30Ncm. Titanium Alloy.

Cover Cap, Abutment for Screw

PXABCC

Cover Cap, Abutment for Screw

Packaged with all Abutments for Screw. Hand-tighten with .050" (1.25mm) Hex Driver. Titanium Alloy.

**Abutment for Screw components are now universal for Internal, Tapered Internal, External and Single-stage provided the new Abutments for Screw are used. For legacy External Abutment for Screw component availability, contact Customer Care.*

products shown not to scale

Hex Adapter, Abutment for Screw

PXHA

Hex Adapter, Abutment for Screw*

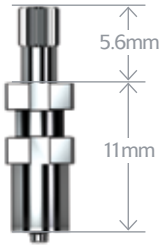
Use to place Abutment for Screw. May be driven by either Hand Wrench, Torque Wrench or AS123 Hand Unit.

Direct Pick-up Coping, Abutment for Screw

PXABDC

Direct Pick-up Coping, Abutment for Screw

Use to make a direct pick-up impression (open-tray) at the abutment level. Packaged with the Screw (long), Abutment for Screw (PXABSL). Use only with Abutment for Screw. Titanium Alloy.

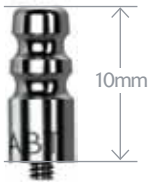


Indirect Transfer Coping, Abutment for Screw

PXABIC

Indirect Transfer Coping, Abutment for Screw

Use to make an indirect transfer (closed-tray) impression at the abutment level. Use only with Abutment for Screw. Titanium Alloy.



Analog, Abutment for Screw

PXABA

Analog, Abutment for Screw

Use at lab to represent the Abutment for Screw/Implant assembly in the working cast. Not for use with implant-level impressions.

Screw (regular or long), Abutment for Screw

PXABS

Screw (regular), Abutment for Screw (5 pack)

Use to retain bars or prostheses fabricated with the Abutment for Screw Copings. Utilizes the .050" (1.25mm) Hex Driver. Final torque: 30 Ncm. Titanium Alloy.

PXABSL

Screw (long), Abutment for Screw (5 pack)

Use in the lab when a longer screw is desired. Use only with the Abutment for Screw. Up to 7mm can be removed from the screw without losing the hex engagement. Hand-tighten or torque to 30Ncm depending on application. Titanium Alloy.

**instrument o-rings & c-rings wear out over time. If an instrument is no longer held securely by its associated driver, order a replacement ring through Customer Care.*

products shown not to scale

Prosthetic Instrumentation System

320-000 **Complete Prosthetic Instrumentation System (shown)**

Includes:

- AS123 Hand Unit
- Hand Wrench
- 30 Ncm Torque Wrench
- Sterilization Tray
- .050" (1.25mm) Hex Driver, Regular
- .050" (1.25mm) Hex Driver, Long
- Hex Adapter for Abutment for Screw
- 4mm Square Drive Extender

320-101 **Basic Prosthetic Instrumentation Kit (not shown)**

Identical to the Complete Prosthetic Instrumentation System, but excludes the AS123 Hand Unit and Hex Adapter for Abutment for Screw.

300-070 **Prosthetic Sterilization Tray (not shown)**

Autoclavable tray for prosthetic instrumentation (included with the 320-000 and 320-101).

300-400 **Hand Wrench***

Use on drive end of AS123 Hand Unit. Also fits individual Hex Drivers/Adapters and Bone Taps.

300-206 **4mm Square Drive Extender***

Replaced 300-205 starting in June 2010. Includes PEEK C-ring for durable retention in Ratchet. Cannot be used with bone taps.

300-100 **AS123 Hand Unit***

Provides improved vision and easy access to prosthetic components in posterior regions of the mouth. Hand Wrench and Drivers are sold separately.

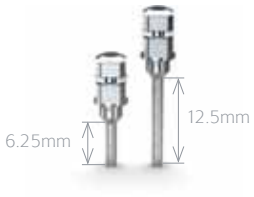
300-430 **30 Ncm Torque Wrench**

Use break-style design to deliver 30 Ncm of torque to prosthetic components.

PXHA

Hex Adapter, Abutment for Screw*

Use to place Abutment for Screw. May be driven by either Hand Wrench, Torque Wrench or AS123 Hand Unit.



300-350 (regular)
300-351 (long)

.050" (1.25mm) Hex Driver Regular or Long*

Use to tighten all hex-driven prosthetic screws.
In early 2011, a running change was made to improve abutment screw retention and handling.

**instrument o-rings & c-rings wear out over time. If an instrument is no longer held securely by its associated driver, order a replacement ring through Customer Care.*

products shown not to scale

Abutment Clamp

IMPAH **Abutment Clamp**

Use to hold two-piece abutments during delivery and tightening of the Abutment Screw.

Adjustable Torque Wrenches

ATW **ITL Precise Adjustable Torque Wrench**

Designed to place both implants and abutments with 9 distinct torque settings (15, 20, 25, 30, 35, 40, 45, 50 and 60 Ncm). A simple twist of the handle locks in precision-engineered torque values and guarantees accuracy and repeatability.

EL-C12374 **Elos Adjustable Torque Wrench**

Lightweight titanium design is easy to use as an adjustable torque wrench or a ratchet. Quickly disassembles for cleaning. No calibration required.

Abutment Prepping Handles

293-100 **3.5mm Implant Analog Handle**

294-100 **4.0mm Implant Analog Handle**

295-100 **5.0/6.0mm Implant Analog Handle**

Use to comfortably hold External abutments for chairside or laboratory preparation. Abutments are secured to the handle with a standard abutment screw. Comes in three platform sizes: 3.5, 4.0mm and 5.0/6.0mm.

Hex Drivers

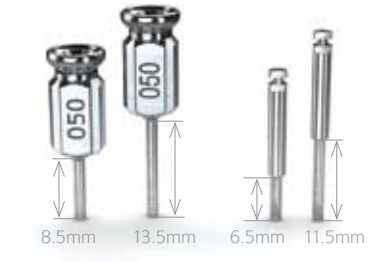
135-351 **.050" (1.25mm) One-piece Hex Driver***

135-451 **.050" (1.25mm) One-piece Hex Driver, Long***

134-350 **.050" (1.25mm) Handpiece Hex Driver**

134-450 **.050" (1.25mm) Handpiece Hex Driver, Long**

For installation and removal of Cover Screws, Healing Abutments and abutment screws. The Hex Drivers, Long (134-450 and 135-451) are 5mm longer than the standard versions (134-350 and 135-351).
In early 2011, a running change was made to improve abutment screw retention and handling.



Clean-out Tap Tools

123-001 **3.5mm Implant Clean-out Tap Tool**

124-001 **4.0/5.0/6.0mm Implant Clean-out Tap Tool**

122-170 **Abutment for Screw Clean-out Tap Tool**

Use to re-thread External implants or Abutments for Screw where the internal threads have become damaged. Requires a standard surgical Ratchet (130-000) or Hand Wrench (300-400) as a drive mechanism.

**instrument o-rings & c-rings wear out over time. If an instrument is no longer held securely by its associated driver, order a replacement ring through Customer Care.*

products shown not to scale

This Surgical Manual serves as a reference for using the External implants and surgical instruments. It is intended solely to provide instructions on the use of BioHorizons products. It is not intended to describe the methods or procedures for diagnosis, treatment planning, or placement of implants, nor does it replace clinical training or a clinician's best judgment regarding the needs of each patient. BioHorizons strongly recommends appropriate training as a prerequisite for the placement of implants and associated treatment.

The procedures illustrated and described within this manual reflect idealized patient presentations with adequate bone and soft tissue to accommodate implant placement. No attempt has been made to cover the wide range of actual patient conditions that may adversely affect surgical and prosthetic outcomes. **Clinician judgment as related to any specific case must always supersede any recommendations made in this or any BioHorizons literature**.

Before beginning any implant surgical procedure with BioHorizons implants:

- Read and understand the Instructions for Use that accompany the products.
- Clean and sterilize the surgical tray and instruments per Instructions for Use.
- Become thoroughly familiar with all instruments and their uses.
- Study Surgical Kit layout and iconography.
- Design a surgical treatment plan to satisfy the prosthetic requirements of the case.

Indications for Use

BioHorizons dental implants may be used in the mandible and maxilla for use as an artificial root structure for single tooth replacement or as abutments for bridgework and denture retention.

VIP Treatment Planning

Virtual Implant Placement (VIP) treatment planning software is a user-friendly solution that reduces clinical challenges and enhances post-operative outcomes.

- Interactive 2D and 3D treatment planning
- Self processing DICOM converter
- Case viewer available for download from BioHorizons website

products shown not to scale

Two-stage Protocol

Two-stage surgery was the original protocol developed for placing modern dental implants. In this type of surgery, the implant is placed below the soft tissue and protected from occlusal function and other forces during osseointegration. A low-profile Cover Screw is placed on the implant to protect it from the ingress of soft tissue.

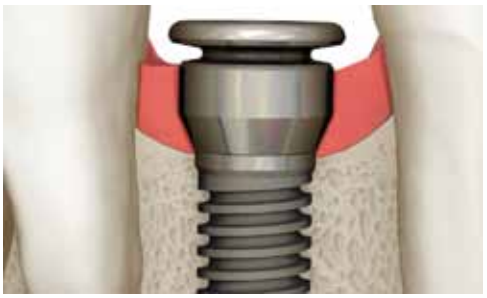
Following osseointegration, a second surgery exposes the implant and a transmucosal Healing Abutment is placed to allow for soft tissue healing and development of a sulcus. Prosthetic restoration begins after soft tissue healing.

External implant with Cover Screw in a two-stage protocol.

Single-stage Protocol

Single-stage surgery may be accomplished with the External implant by placing a healing abutment at the time of initial implant surgery. This eliminates the need for a second surgery to expose the implant. Although the implant is not in occlusal function, some forces can be transmitted to it through the exposed transmucosal element.

Prosthetic restoration begins following osseointegration of the implant and soft tissue healing.



External implant with removable Healing Abutment in a single-stage protocol.

Non-functional Immediate Restoration

Single-stage surgery with non-functional immediate provisionalization provides the patient a non-functioning provisional prosthesis early in the treatment plan. An abutment is placed on the implant at or shortly after surgery, and a provisional restoration is secured to it with temporary cement. The provisional can help contour the soft tissue profile during healing.

External implant restored with a non-functional provisional prosthesis.

Immediate Function Restoration

Single-stage surgery with immediate function is possible in good quality bone where multiple implants exhibiting excellent initial stability can be splinted together. Splinting implants together can offer a significant biomechanical advantage over individual, unsplinted prostheses.

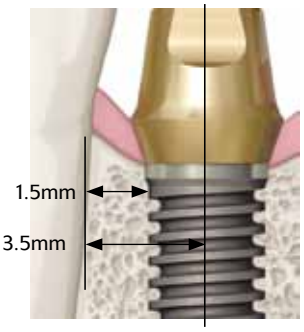
External implants with a splinted prosthesis in immediate function.

products shown not to scale

During implant placement, clinicians must apply their best judgment as to the appropriate spacing for individual patient conditions.

Spacing considerations for BioHorizons External implants (measurements are taken at the osseous crest):

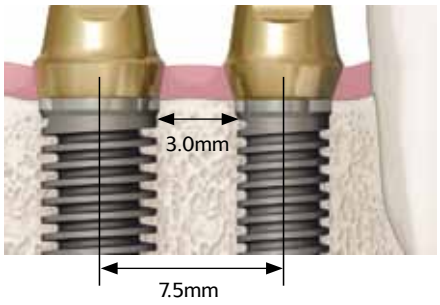
The osteotomy centerpoint required to maintain a 1.5mm implant-to-tooth spacing (generally accepted) is
½ [implant body diameter] + 1.5mm.



Osteotomy center 3.5mm from adjacent tooth
(4.0mm implant pictured)

body diameter	osteotomy center from adjacent tooth
3.5mm	3.3mm
4.0mm	3.5mm
5.0mm	4.0mm
5.0mm	4.5mm

The osteotomy center-to-center measurement required to maintain a 3.0mm edge-to-edge spacing (generally accepted) between External implants is
½ [sum of 2 implant body diameters] + 3.0mm.



Measurement is dependent on the two implant body diameters.
(4.0 & 5.0mm implants pictured)

body diameter	**3.5mm**	**4.0mm**	**5.0mm**	**6.0mm**
3.5mm	6.5mm			
4.0mm	6.8mm	7.0mm		
5.0mm	7.3mm	7.5mm	8.0mm	
5.0mm	7.8mm	8.0mm	8.5mm	9.0mm

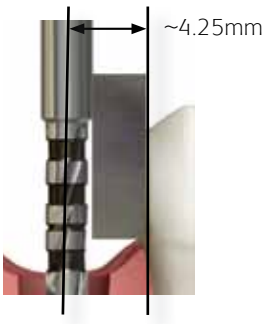
Implant Spacer / Depth Probe

Purpose: Multi-function instrument for intraoral measurements.

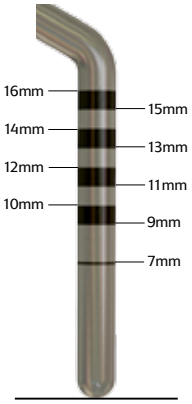
- Five centimeter graduated ruler on shaft

The rectangular end of the tool provides intraoral measurements.

Useful for marking center-to-center implant spacing on the ridge.



The rectangular end against an existing crown places the osteotomy ~4.25mm from the contact.



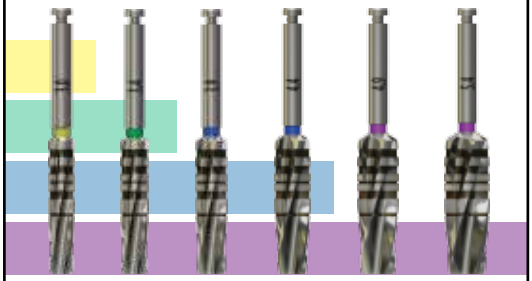
Probe tip measures osteotomy depth.
Note: *these markings are different than the tapered drill markings*

products shown not to scale

SURGICAL KIT LAYOUT

The External Surgical Kit uses an intuitive layout to guide the surgeon through the instrument sequence. The sequence begins in the upper left hand corner and works left-to-right and then down. Color-coded lines, instruments and grommets are matched with each implant and further aid in instrument selection and identification.

Prior to use, clean and sterilize the surgical tray and instruments per appropriate Instructions for Use and study the Surgical Kit layout, color-coding and iconography. Surgical assistants should also be thoroughly familiar with all instruments and their uses.

Depth Drill Sequence	Width Increasing Drill Sequence	Crestal Bone Drills	Bone Taps	Abutment-level and/or Implant-level Drivers
				

products shown not to scale

The Surgical Drills included in the External Surgical Kit are externally irrigated and designed to be used at speeds of 850-2,500 rpm[9] with steady sterile irrigation. Reduced drill speed may be desired in softer bone or as drill diameter increases.

The depth marks are consistent throughout the Starter Drill, Depth Drills and Width Increasing Drills. The thick bands are each one millimeter wide. Thin lines are used to mark 7mm and 11mm.

Drilling Considerations

Peri-operative oral rinses with a 0.12% Chlorhexidine Digluconate solution have been shown to significantly lower the incidence of post-implantation infectious complications.[10] A preoperative 30-second rinse is recommended, followed by twice daily rinses for two weeks following surgery.

Drilling must be done under a constant stream of sterile irrigation. A pumping motion should be employed to prevent over-heating the bone. Surgical drills and taps should be replaced when they are worn, dull, corroded or in any way compromised. BioHorizons recommends the replacement of drills after 12 to 20 osteotomies.[11] A Drill-usage Tracking Chart is available from BioHorizons to aid offices in archiving this important information.

There is a risk of injury to the mandibular nerve associated with surgical drilling in lower posterior regions. To minimize the risk of nerve injury, it is imperative the clinician understand the drill depth markings in order to correlate implant length with the actual drilling depth to produce the desired vertical placement of the implant.

products shown not to scale

2.0mm Starter Drill

Purpose: Initiates osteotomy.

- Chisel-tip design eliminates "skating" on osseous crest
- Initiates osteotomy to desired depth
- Prepares site for Paralleling Pins

2.5mm Depth Drill

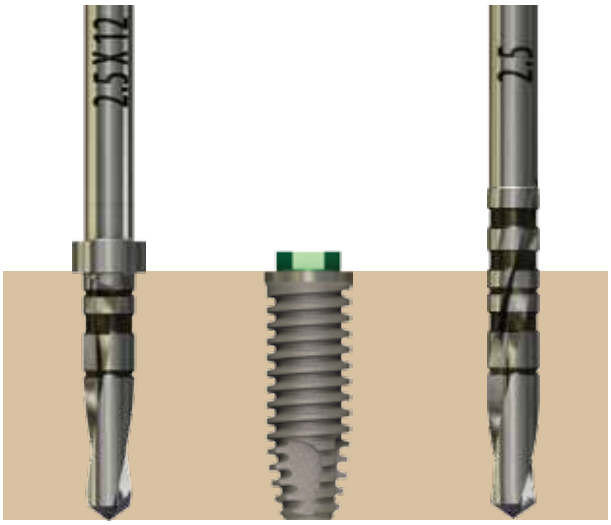
Purpose: Sets osteotomy depth following use of the 2.0mm Starter Drill.

- Efficient cutting drill design collects bone for autografting

2.5mm Depth Drill with Stop

Purpose: Sets osteotomy depth following use of the 2.0mm Starter Drill.

- Fixed circular ring acts as a definitive drill stop
- One drill length for each implant length
- 1mm laser-etched line guides supracrestal implant placement
- BioHorizons Surgical Kit includes spare slots for Depth Drills with Stops
- Please call for availability



2.5 x 12mm Depth Stop Drill

12mm long External Implant

2.5mm Depth Drill without Stop

products shown not to scale

Parallel Pins

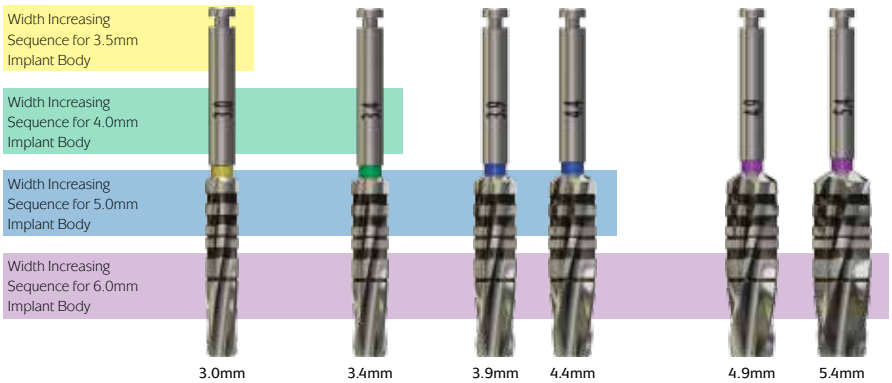
Purpose: Evaluation of osteotomy position and angle.

- Provided straight and with a 20° angle
- Use after 2.0mm Starter Drill and 2.5mm Depth Drills
- 9mm shank for radiographic evaluation of proximity to adjacent anatomy
- Hub diameter is 4.0mm

Width Increasing Drills

Purpose: Incrementally widens the osteotomy without creating excessive heat.

- Depth-marked for reference. Non-end cutting geometry for added safety
- Efficient cutting geometry collects bone for autografting
- Color-coded by the smallest diameter implant body with which it is used



Variations in bone density or possible voids require surgeons to observe the drill's depth markings as the primary determinant of drilling depth, rather than relying exclusively on the non-end cutting geometry to stop the drill.

If a Width Increasing Drill fails to reach the planned depth as shown by the depth marks, use the 2.5mm Depth Drill to re-establish the depth and recommence the Width Increasing Sequence with the 3.0mm Width Increasing Drill.

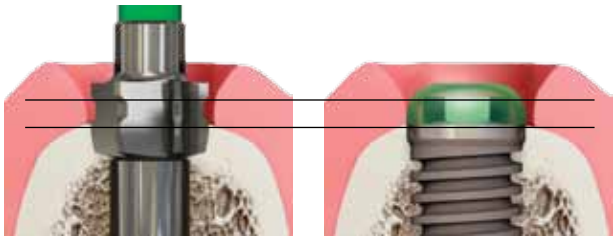
products shown not to scale

Crestal Bone Drills

Purpose: Removes cortical bone at ridge crest to facilitate pressure-free seating of the implant collar.

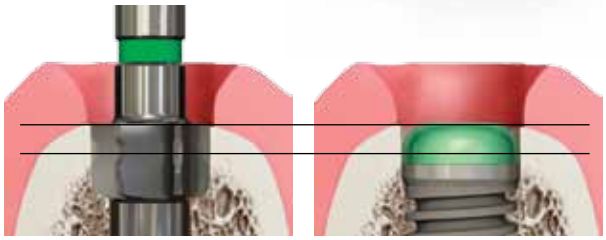
- Site Specific. Indicated when dense cortical bone is present at crest
- Rounded non-end cutting hub centers drill in osteotomy
- Used following the final Width Increasing Drill for each implant
- 850-2,500 rpm with steady irrigation[11]

Do not fully seat the drill if all or a portion of the collar is to be left supracrestal. Fully seating the drill allows the implant to be placed with the prosthetic platform level with the crestal ridge.



Partially seat drill. (Supracrestal)

1mm left above osseous crest.



Fully seat drill. (Crestal)

Implant level with osseous crest.

- Preparing to Level 1 allows placement of the prosthetic platform level with the crest.
- Preparing to Level 2 allows placement of the Cover Screw level with the crest, *provided the osteotomy has been prepared to accommodate the additional depth*.

Bone Taps

Purpose: Prepares dense cortical bone for implant threads.

- Site specific
- 30 rpm or less[12]
- Final instrument prior to implant placement
- Square drive shaft interfaces with Ratchet and Hand Wrench

Place the tip of the Bone Tap into the osteotomy, apply firm apical pressure and begin rotating slowly in a clockwise direction (30 rpm or less is recommended)[12]. When the threads engage, allow the tap to feed without excessive pressure. To remove, rotate the Bone Tap in a counter-clockwise direction, allowing it to back out of the osteotomy.
Do not pull on the Bone Tap to remove it from the site.

products shown not to scale

Implant Packaging

External implants are provided in a blister pack with multiple peel-and-stick labels for affixing to the patient's chart. When the lid of the blister tray is removed, the sterile implant vial is exposed and may then be placed in the sterile field. While holding the vial in an upright fashion, remove the cap by rotating it in a counter-clockwise direction. The implant can then be removed from the vial by engaging the premounted 3inOne Abutment with the appropriate Adapter.

products shown not to scale

Handpiece and Ratchet Adapters (Abutment-level)

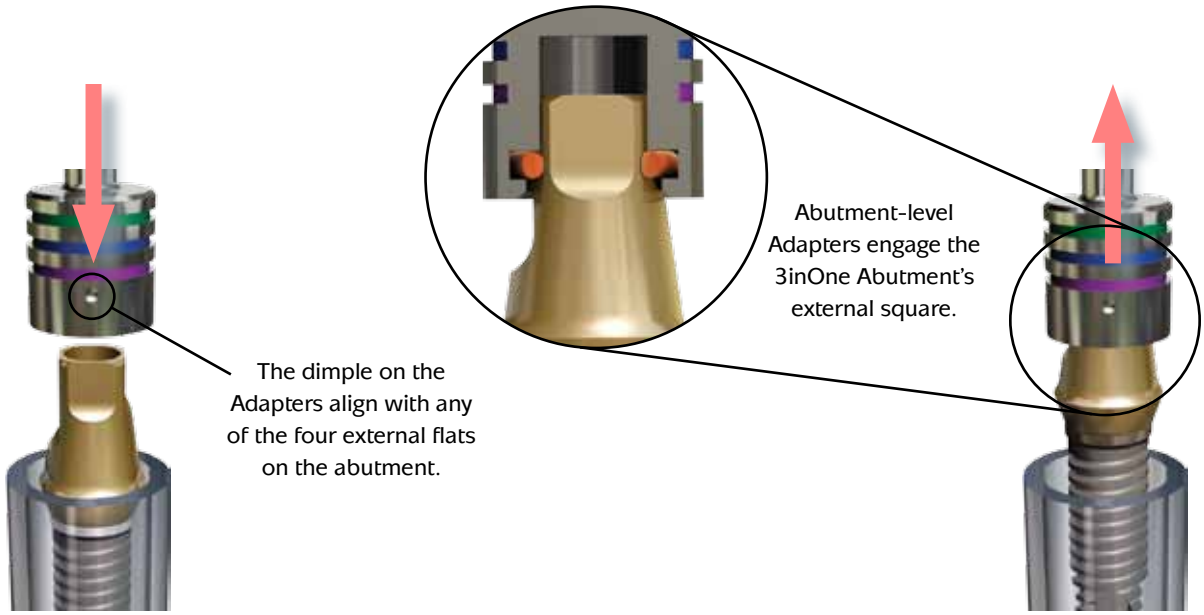
Purpose: Engages the 3inOne Abutment allowing the implant to be driven into the osteotomy.

- Premounted 3inOne Abutment serves as the surgical drive mount
- O-ring secures implant while it is carried to osteotomy
- Electric handpiece or manual insertion options
- 30 rpm or less[12]

Handpiece and Ratchet Adapters engage External implants via the square on the coronal aspect of the 3inOne abutment. Remove the cap from the inner vial and seat the chosen Adapter. Remove the implant from the vial and carry it to the osteotomy on the Adapter, taking precautions not to touch the implant surface during the transfer.

Place the apex of the implant into the osteotomy, apply firm apical pressure and begin rotating in a clockwise direction (30 rpm or less). Once the apical threads engage the bone, allow the implant to feed without excessive pressure.

Overtightening the implant in the osteotomy may cause osseous microfracture or pressure-induced necrosis of the adjacent bone. Manual seating via the Adapter for Ratchet may be desired to gain a tactile sense of final implant placement. If too much resistance is felt during insertion, remove the implant and revise the osteotomy with the appropriate Crestal Bone Drill or Bone Tap as deemed necessary to reduce insertion torque.



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3inOne Abutment Removal

To remove the 3inOne Abutment, engage the Abutment Screw with the .050" (1.25mm) Hex Driver. Apply firm apical pressure to the Hex Driver and rotate counter-clockwise until the screw is completely disengaged from the implant body.

In soft bone, or when the implant lacks initial stability, an Abutment Clamp (ref. IMPAH, sold separately) should be used to grasp the outside of the abutment to provide counter-torque during the loosening of the Abutment Screw.

The 3inOne Abutment and the Abutment Screw should be retained with the patient's chart. They can later be used in the impression making procedure and as a temporary or final abutment for cement retention.

Hex Orientation

The longest flat surface on the external aspect of the 3inOne Abutment is indexed to one of the six flats of the implant's external hexagon. In most cases one of the hex flats should be oriented to the facial aspect, as it allows for angulation correction with stock angled abutments. Placing the long flat of the 3inOne Abutment to the facial also leaves more room for porcelain in that area on the final prosthesis.

The implant's rotational position can be adjusted following removal of the 3inOne Abutment using the Implant-level Insertion Tools.

Insertion Tools (Implant-level)

Purpose: Engages external hex allowing implant's position to be adjusted in the osteotomy.

- May be used following removal of the 3inOne Abutment
- Offers a narrower path of insertion and better clearance than the 3inOne Abutment / Abutment-level Adapter option
- Square drive shaft interfaces with the Ratchet and Hand Wrench

Mate the appropriate Insertion Tool with the external hex of the implant and lightly screw into place. Engage the Insertion Tool with either the Ratchet or Hand Wrench and rotate the implant to the required position.

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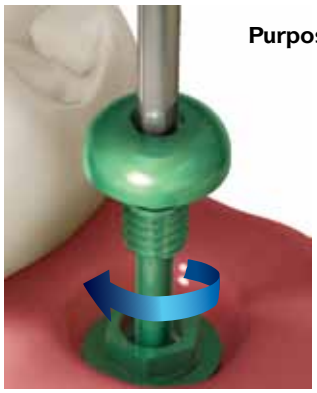
Cover Screws



Purpose: Protects prosthetic platform in two-stage (submerged) surgical protocols.

- Packaged with each implant in the sterile inner vial
- Hand-tighten (10-15 Ncm)[13] utilizing .050" (1.25mm) Hex Driver
- Color-coded by implant body diameter

Remove the 3inOne Abutment and thoroughly irrigate the inside of the implant to remove blood and other debris. Unscrew the Cover Screw (included in each implant vial) from its holder and screw it into the implant using the .050" (1.25mm) Hex Driver. Following placement of the Cover Screw, the surgical site should be irrigated and the soft tissue adapted in a normal surgical fashion. Take precautions to prevent the Cover Screw from being aspirated by the patient.

Healing Abutments

Purpose: Transmucosal element for single-stage surgical protocol or for soft tissue healing period following second-stage uncovery.

- Select by height and emergence profile
- Hand-tighten (10-15 Ncm)[13] utilizing .050" (1.25mm) Hex Driver
- Color-coded by implant body diameter
- Encoded for easy intraoral identification, for example:
  4 x 4.5 indicates **4**.0mm implant diameter x **4.5**mm high

Healing Abutments are placed after uncovery in a two-stage surgical protocol, or in lieu of a Cover Screw in a single-stage (non-submerged) protocol. Prior to seating the Healing Abutment, thoroughly irrigate the inside of the implant to remove blood and other debris. An antibacterial paste may be placed on the screw portion to decrease the risk of bacterial growth within the implant body during the healing phase. Following seating, irrigate the surgical site and adapt the soft tissue in normal surgical fashion. A gingivectomy or apically positioned flap technique may be used to reduce the soft tissue thickness and to decrease sulcular depth around the implant. The suture groove on the Healing Abutment may be used to apically position the soft tissue flap. Take precautions to prevent the Healing Abutment from being aspirated by the patient.

All 7mm implants come packaged with a special Cover Screw and Abutment Screw that have shorter guide pins for complete seating into the 7mm implant. Standard length Abutment Screws and Healing Abutments can be used provided the guide pin is carefully removed at the notch using a high-speed carbide disk. Please refer to the External -7mm Length Implants manual (ref. L0151) for detailed information.

products shown not to scale

Bone Profiler

Purpose: Remove and contour excess bone and soft tissue from the area of the prosthetic platform.

- Compatible with latch-type, speed-reducing handpieces
- 850-2,500 rpm drill speed with steady sterile irrigation[9]
- Cover Screw protects implant platform
- Bone Profiler cuts away excess bone and soft tissue
- Color-coded by specific prosthetic platform

Do not use the Profiler without the Cover Screw in place.

The Cover Screw aligns the Bone Profiler and protects the implant from damage. The Profiler is used in a latch-type, reduction handpiece under copious amounts of sterile irrigation. Following removal of the excess bone and soft tissue, unscrew the Cover Screw from the implant and seat the desired prosthetic element.

Bur Testing Gauge

Also called a "Go / No-Go Gauge," the Bur Testing Gauge is used to verify the dimensional accuracy of drill shanks of latch-type burs. Burs in proper condition **WILL** fit into the larger diameter hole, but **WILL NOT** fit into the smaller hole (marked red).

Burs that fail either of these criteria are unfit for use and may become stuck in the handpiece if used. The gauge is included with all W&H starter packages, and may also be ordered separately.

Surgical Kit Cleaning

All BioHorizons Surgical Kits are provided non-sterile and must be cleaned and sterilized prior to use following the associated Instructions for Use. Always remove instruments from packaging prior to sterilization, and remove and discard packaging materials used to stabilize and secure kits during shipment. Double-check all surgical instruments to ensure their functionality prior to surgery. Backup sterile drills are also recommended.

Caution: The use of hydrogen peroxide or other oxidizing agents will cause damage to the surface of the instruments. Towel- or air-dry all instrumentation before sterilizing. Drills should be replaced after approximately 12 to 20 osteotomy cycles, depending on the bone density.[11]

Proper testing, cleaning and calibration of sterilization equipment should occur frequently to assure that the units are in proper working order. Equipment operating conditions vary and it is the responsibility of each dental office to ensure that the proper sterilization technique for instrumentation is followed.

products shown not to scale

Post-operative Considerations

A period of unloaded healing is often recommended, depending on individual patient healing rates and initial implant stability. Each case must be independently evaluated. This unloaded healing period allows for integration between the bone and implant surface.

The patient must be instructed to follow a post-surgical regimen including cold packs for 24 hours post-implantation. The patient's diet should consist of soft foods and possibly liquid dietary supplements. Pharmacological therapy should be considered as the patient's condition dictates.

If a removable prosthesis is used during the initial healing phase, it is recommended that a soft liner material be used to prevent pressure on the surgical site. This soft liner should be relieved over the implant site. The patient should be checked periodically to monitor healing of the soft tissues and bone using clinical and radiographic evaluations.

Ongoing hygiene for the implant patient is vital. Hygiene recall appointments at three month intervals are suggested. Instruments designed for implant scaling, such as Implacare® instruments from Hu-Friedy® should be utilized. The stainless steel handles may be fitted with assorted tip designs used for hygiene on natural teeth. The Implacare® scalers will not damage implant abutments and contain no glass or graphite fillers that can scratch titanium implant abutments.

products shown not to scale

Symbol Descriptions for Product Labeling

STERILE R

Sterile by gamma irradiation

Use before expiration date (YYYY-MM)

Single use only

Rx Only

Caution: Federal (USA) law restricts these devices to the sale, distribution and use by, or on the order of, a dentist or physician.

Non-sterile

Non-sterile

See Instructions for Use

Manufacture date (YYYY-MM)

LOT

Lot/batch number

REF

Reference/ article number

CE
0473

BioHorizons products carry the CE mark and fulfill the requirements of the Medical Devices Directive

EU Authorised Representative
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11 Burford Road, Stratford
London E15 2ST United Kingdom
Telephone +44-208-221-2361
Telefax +44-208-221-1912

Prosthetic platform

- 3.5mm Prosthetic Platform
- 4.0mm Prosthetic Platform
- 5.0mm Prosthetic Platform
- 6.0mm Prosthetic Platform

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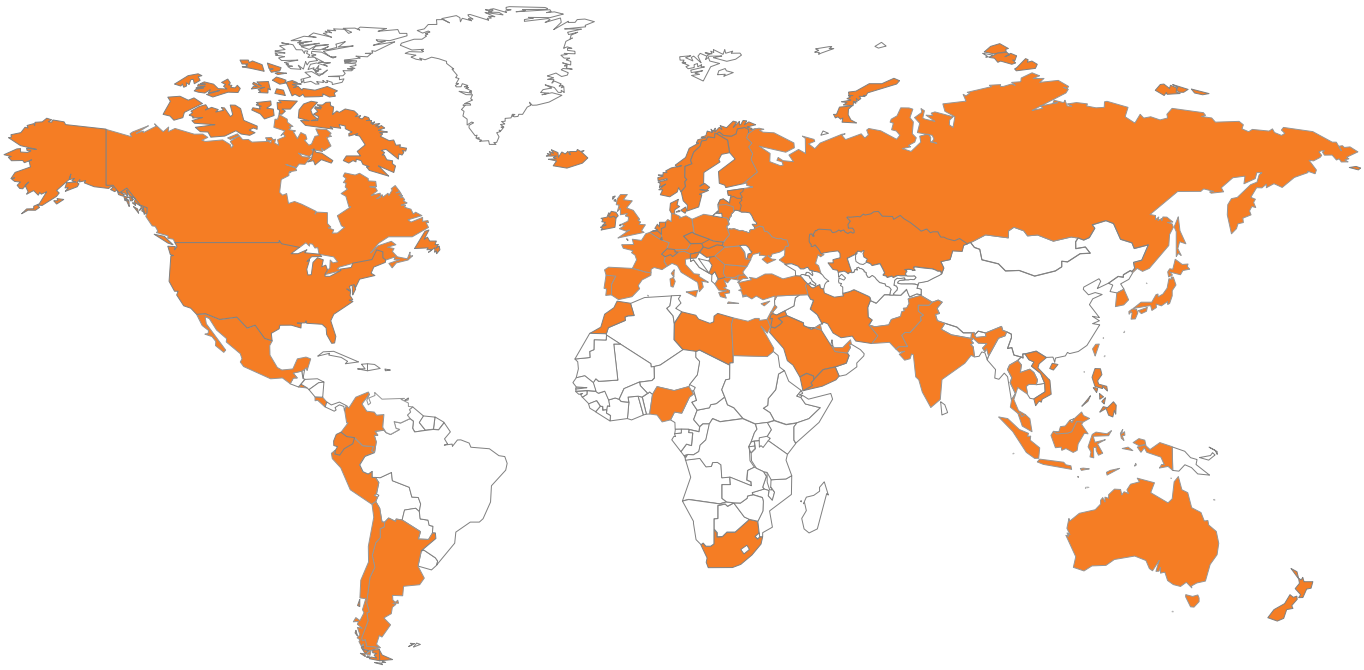

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