DenTack creates and markets innovative high-stability, short expandable implants that carry the same load as longer implants, offering clinicians a viable and cost-effective alternative to bone augmentation for dental implant candidates.

The DenTack QUAD Implant

Unlike existing short implants, DenTack’s expandable QUAD implants have an integral compensation mechanism that enhances initial and long-term stability and load-carrying ability.

Enabling effective, timely implant placement in patients with low bone height, QUAD implants eliminate the need for bone augmentation and sinus lift procedures- significantly lowering treatment cost and duration. Moreover, the load-carrying performance of QUAD implants allows for immediate loading - shortening the overall time to restoration.

Without preliminary surgical intervention, DenTack implants are placed in the jaw as per current common procedure, and behave like standard long implants. During expansion, the implant’s apical portion and folded foils spread out into the surrounding bone, maximizing bone contact area. As it reaches maximum expansion, the apical portion inclines slightly inward to reduce total pressure on the bone.

With an uncompromising commitment to maintaining highest standards of quality in manufacturing, all DenTack implants are CE Mark certified, and are registered under the ISO 13485:2003 international quality standards.
# Implant Geometry

## Internal Hex.

<table>
<thead>
<tr>
<th>Platform</th>
<th>D (mm)</th>
<th>L (mm)</th>
<th>d (mm)</th>
<th>S (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDI4105</td>
<td>4.1</td>
<td>5</td>
<td>4.5</td>
<td>4.2</td>
</tr>
<tr>
<td>EDI4106</td>
<td>4.1</td>
<td>6</td>
<td>4.7</td>
<td>4.4</td>
</tr>
<tr>
<td>EDI4107</td>
<td>4.1</td>
<td>7</td>
<td>4.7</td>
<td>4.4</td>
</tr>
<tr>
<td>EDI3757</td>
<td>3.75</td>
<td>7</td>
<td>4.2</td>
<td>3.9</td>
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</table>

## External Hex.

<table>
<thead>
<tr>
<th>Platform</th>
<th>D (mm)</th>
<th>L (mm)</th>
<th>d (mm)</th>
<th>S (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>External Hex</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internal Hex</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Unique Mechanism for Optimal Stability

Unlike other implants, DenTack implants achieve optimal stability with a unique, error-free expansion mechanism.

By limiting the final range of expansion, and with a self “snap back” mechanism, the DenTack system allows for bone condensation without creating excessive pressure on the surrounding bone - resulting in a square-shaped apex that prevents rotation and markedly improves stability.

After only a short training session, dental surgeons can effectively and safely use DenTack expandable implants, without fear of over-expansion.

Expansion Stages

- **STAGE 1 – IMPLANT PLACEMENT** Slightly conical DenTack implants are placed in bone like any other implant.

- **STAGE 2 – EXPANSION** Using the DenTack expansion tool, the apical portion of the implant is gradually expanded - enhancing surrounding bone density and closing micro-gaps.

- **STAGE 3 – COMPLETELY EXPANDED** With a unique expansion profile, the apical portion of the DenTack implant inclines slightly inward as it reaches maximum expansion, reducing total pressure on the bone tissue.

Enlarged Surface Area

Surface topography: combination of etching and blasting treatment produces a surface texture and porosity ideal for osseointegration
**Static Compression Test - QUAD 7mm**

**Results**

<table>
<thead>
<tr>
<th>Specimen</th>
<th>Ultimate Load [N]</th>
<th>Ultimate Displacement [mm]</th>
<th>Stiffness [N/mm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1</td>
<td>530</td>
<td>0.4</td>
<td>2397.7</td>
</tr>
<tr>
<td>2.2</td>
<td>482</td>
<td>0.6</td>
<td>1819.3</td>
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<tr>
<td>2.3</td>
<td>490</td>
<td>0.5</td>
<td>2085.0</td>
</tr>
<tr>
<td>2.4</td>
<td>504</td>
<td>0.4</td>
<td>2574.4</td>
</tr>
<tr>
<td>2.5</td>
<td>487</td>
<td>0.5</td>
<td>2011.5</td>
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<tr>
<td>2.6</td>
<td>528</td>
<td>0.6</td>
<td>2392.1</td>
</tr>
<tr>
<td><strong>Mean</strong></td>
<td><strong>507</strong></td>
<td><strong>0.6</strong></td>
<td><strong>2213.3</strong></td>
</tr>
<tr>
<td><strong>StdDev.</strong></td>
<td><strong>22</strong></td>
<td><strong>0.1</strong></td>
<td><strong>285.9</strong></td>
</tr>
</tbody>
</table>

Conclusion: Six specimens have been tested in a static compression mode. A mean ultimate load 507N has been determined.

**Dynamic Test - QUAD 7mm**

**AFN curve of the dynamic axiel compression test**

Conclusion: The run-out load established herein according to ISO 14801:2007 is 170N. Three specimens reached 5 million load cycles at this level without failure.
**In–Vitro Initial Stability Evaluation**

Unlike standard implants, which show a direct relationship between implant length and initial stability, DenTack expandable implants derive stability from their unique design, achieving even greater stability than longer screw-type implants.

The results below present the behavior of each implant under a compression test where both vertical and lateral forces were applied. DenTack’s unique design enables a 7mm implant to provide stability comparable to 10 mm standard implant.

- **8mm cylindrical shape**
  - 8mm screw - type implant - yield at 278N

- **10mm cylindrical shape**
  - 10mm screw - type implant - yield at 344N

- **QUAD7mm**
  - 7mm Expandable DenTack Implant - yield at 372N
In-Vivo Primary Stability Test – Osstell ISQ

Comparison between the QUAD in contracted configuration and expanded configuration, noting the contribution of the expanded apical portion to primary stability.

<table>
<thead>
<tr>
<th>Tooth No.</th>
<th>Osstell Probe Direction</th>
<th>Before Expansion</th>
<th>After Expansion</th>
</tr>
</thead>
<tbody>
<tr>
<td>45</td>
<td>Buccal-lingual mesial-Distal</td>
<td>28 ISQ 25 ISQ</td>
<td>78 ISQ 78 ISQ</td>
</tr>
<tr>
<td>46</td>
<td>Buccal-lingual mesial-Distal</td>
<td>22 ISQ 22 ISQ</td>
<td>64 ISQ 60 ISQ</td>
</tr>
</tbody>
</table>

QUAD7mm implants after expansion
Surgical Protocol

Packaging:

DenTack’s implant is packed in a double vial package, which contains also a cover screw.

A blue mount, allowing for simple differentiation between mount and implant, is attached to the implant.

Implant Placement:

A torque ratchet is used for the placement of the implant. Torque should not exceed 35Ncm while placing the implant. If higher torque is required, the implant should be removed gently, and the next drill size used to enlarge the ossteotomy. Then, the implant may be re-inserted.

NOTE: See implant position.

After implant placement, the blue mount is removed, and the expansion tool attached to the implant, noting correct fit to the internal implant hex.
**Surgical Protocol**

While holding the handle to prevent any implant movement, the torque ratchet is attached to the expansion tool and rotated slowly clockwise. The torque should not exceed 35 Ncm. The expansion tool’s two yellow bands will come into close contact when expansion is completed. Rotating the inner screw counterclockwise while holding the handle detaches the torque ratchet from the implant.

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**Optimal Implant Position**

During implant placement, clinicians are required to maintain a minimum spacing of 1.5mm from adjacent tooth and buccal and lingual plates. When two implants are necessary, a spacing of 3 mm is required.

The apical portion of the implant becomes wider after expansion, and must be considered for appropriate spacing.
**Surgical Drilling Sequences**

**Maximilla**
- Ø 3.75 Implant Dia.

**Maximilla**
- Ø 4.1 Implant Dia.

**Mandible**
- Ø 3.75 Implant Dia.

**Mandible**
- Ø 4.1 Implant Dia.
Although DenTack implants feature a standard hex connection, DenTack’s prosthetic components are uniquely manufactured and designed to fit and complement DenTack’s implants. Abutments are made of a biocompatible titanium alloy Ti6Al4V ELI. Abutments, impression and laboratory components of the DenTack System are designed for single use only. Healing screws, abutments and all other prosthetic components are delivered decontaminated but non-sterile.

Warning:
Users of the DenTack system must be trained dentists. All users must have a background which includes specific training in implant dentistry and implant prosthodontics. Prosthetic components are small objects, and therefore may present inhalation hazards to the patients. Special care should be used when handling these components.

**Impression Taking**

1. In order to take an impression, remove the healing screw by rotating it counterclockwise.
2. Clean the internal compartment of the implant.
3. Place an impression coping by adjusting the hex connection to the compartment of the implant and by securing the screw clockwise.
4. Take a standard impression, making sure that wash type impression material covers the impression coping completely.
5. After setting, take the impression out of the mouth.
6. Attach an implant analog to the impression coping, and place it back on the impression, making sure that the coping fits its original position.
**Abutment Connection**

1. In order to place an abutment, remove the healing screw by rotating it counterclockwise.
2. Clean the compartment of the implant.
3. Place the abutment by adjusting the hex connection to the internal compartment of the implant and by securing the screw clockwise. Using a torque wrench, apply torque of 20 Ncm.

**Ball Attachment**

1. In order to place a ball attachment, remove the healing screw by rotating it counterclockwise.
2. Clean the compartment of the implant.
3. Place the ball attachment by adjusting internal compartment of the implant and by securing the screw clockwise. Using a torque wrench apply torque of 20 Ncm.
4. Insert a nylon ball attachment cap into its housing.
5. Adhere the housing to the denture following standard procedures.
Products

Implants
Prosthetic – Internal Hex. Platform
Prosthetic – External Hex. Platform
Surgical Instruments
# Implants

<table>
<thead>
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Healing Screws for External Hex.

**Healing Screws**
Healing Screw is suitable for 4.1 implant diameter with External Hex.

![Healing Screw Illustration](image)

**HC-300 EX**  **HC-400 EX**

Prosthetic - Impression for External Hex.

**Implant Impression Transfer.**
Implant impression open tray transfer is suitable for 4.1 implant diameter with External Hex.

![Impression Transfer Illustration](image)

**IC-750 EX**

**Implant Analog.**
Implant Analog is suitable for 4.1 implant diameter with External Hex.

![Implant Analog Illustration](image)

**IA-415 EX**
Titanium Abutment for External Hex.

**Straight Titanium Abutment**
Straight Abutment is suitable for 4.1 implant diameter with External Hex.

SA-100 EX  SA-200 EX  SA-300 EX  SA-500 EX

**Prosthetic - Impression for External Hex.**

**Angled Titanium Abutment.**
Angled Abutment is suitable for 4.1 implant diameter with External Hex.

15 degree angle abutment  AA-15L EX

15 degree angle abutment  AA-150 EX

25 degree angle abutment  AA-250 EX
Multi Unit Abutment System for External Hex.

**Straight Multi-unit abutment**
Straight Multi-unit abutments may be used for multiple-unit screw-retained restorations at the abutment level and is suitable for 4.1 implant diameter with External Hex.

![Images of Multi Unit Abutment System](image)

**MU-413 EX**  **MU-414 EX**  **MUA-230**  **MUS-230**

**Ball Attachment for External Hex.**
The ball attachment are used for implant-support overdentures and is suitable for 4.1 implant diameter with External Hex.

![Images of Ball Attachment System](image)

**BA-210 EX**  **BA-310 EX**  **BA-410 EX**  **H-AB**  **NCT-AB**
Healing Screws for Internal Hex.

**Healing Screws**
Healing Screw is suitable for 3.75 and 4.1 implant diameter with Internal Hex.

- **HC-200**
- **HC-300**
- **HC-400**

Prosthetic - Impression for Internal Hex.

**Implant Impression Transfer.**
Implant impression open tray transfer is suitable for 3.75 and 4.1 implant diameter with Internal Hex.

- **IC-750**

**Implant Analog.**
Implant Analog is suitable for 3.75 and 4.1 implant diameter with Internal Hex.

- **IA-375**
**Screws Retained Restorations for Internal Hex.**

Raising the height for performing various procedures like overdentures, bridges and bars in a 3.75 and 4.1 implant diameter with Internal Hex.

![Screw Attachments Diagram](image)

**Anti-rotation sleeve**  **Round sleeve**  **Abutment for casting**

- SRA-15M
- SRA-25M
- PST
- PST
- CA-100

**Ball Attachments for Internal Hex.**

The ball attachments are used for implant-supported overdentures and is suitable for 3.75 and 4.1 implant diameter with Internal Hex.

![Ball Attachments Diagram](image)

- BA-510
- BA-210
- BA-310
- H-AB
- NCT-AB
Multi Unit Abutment System for Internal Hex.

Straight Multi-unit abutment
Straight Multi-unit abutments may be used for multiple-unit screw-retained restorations at the abutment level and is suitable for 3.75 and 4.1 implants diameter with Internal Hex.

MU-412
MU-413
MU-414
MUA-230
MUS-230
Titanium Abutment for Internal Hex.

**Straight Titanium Abutment**
Straight Abutment is suitable for 3.75 and 4.1 implant diameter with Internal Hex.

- **SA-100**
- **SA-200**
- **SA-300**
- **SA-500**

**Angled Titanium Abutment.**
Angled Abutment is suitable for 3.75 and 4.1 implants diameter with Internal Hex.

- **AA-15L**
- **AA-150**
- **AA-250**

15 degree angle abutment
15 degree angle abutment
25 degree angle abutment
### Surgical Instruments

<table>
<thead>
<tr>
<th>Cat. No. / Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ET-8500 EX</strong> – Expansion tool for Ext. Hex. – Short ver.</td>
</tr>
<tr>
<td><strong>ET-8500</strong> – Expansion tool for Int. Hex. – Short ver.</td>
</tr>
<tr>
<td><strong>RT-3500</strong> – Ratchet Torque.</td>
</tr>
<tr>
<td><strong>HW-4000</strong> – Hand Wrench.</td>
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</table>