Implanting TissueCare

The true value of an implant system becomes apparent with time. For over 25 years, the ANKYLOS implant system stands for stable, long-term esthetics. The results from numerous publications and long-term clinical experience demonstrate that ANKYLOS maintains hard and soft tissue stability, ensuring natural and lasting esthetics. The core to this success is the unique ANKYLOS TissueCare Concept, which is the sum of all the key features of the ANKYLOS system design.
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Discover ANKYLOS®

For more than 25 years, the ANKYLOS system developed by Prof. Dr. G.-H. Nentwig and Dr. Dipl.-Ing. Walter Moser with its TissueCare Connection using the taper principal has stood for successful long-term hard and soft-tissue stability and long-term red-white esthetics.

**Indications**

- The ANKYLOS C/X Implant system is for single-stage or two-stage surgical procedures and cemented, removable or screw retained restorations.
- The ANKYLOS C/X Implant system may be used for immediate placement and function on single tooth and/or multiple tooth applications when adequate primary stability is achievable, with appropriate occlusal loading, in order to restore chewing function. Multiple tooth applications may be splinted.
ANKYLOS® C/X implant diameters and lengths

ANKYLOS C/X implants are available in four diameters and various lengths. The practical size classification makes them suitable for all indications in dental implantology with a manageable number of implants.

<table>
<thead>
<tr>
<th>Ø</th>
<th>L</th>
<th>8 mm</th>
<th>9.5 mm</th>
<th>11 mm</th>
<th>14 mm</th>
<th>17 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.5 mm</td>
<td>A 8</td>
<td>A 9.5</td>
<td>A 11</td>
<td>A 14</td>
<td>A 17</td>
<td></td>
</tr>
<tr>
<td>4.5 mm</td>
<td>B 8</td>
<td>B 9.5</td>
<td>B 11</td>
<td>B 14</td>
<td>B 17</td>
<td></td>
</tr>
<tr>
<td>5.5 mm</td>
<td>C 8</td>
<td>C 9.5</td>
<td>C 11</td>
<td>C 14</td>
<td>C 17</td>
<td></td>
</tr>
<tr>
<td>7.0 mm</td>
<td>D 8</td>
<td>D 9.5</td>
<td>D 11</td>
<td>D 14</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Individual implants are identified by a capital letter that indicates the diameter and a number. The number shows the length of the implant in millimeters.

The structure-maintaining implant design

The structure-maintaining ANKYLOS® thread design

The progressive ANKYLOS implant thread is perceptibly easier to screw into position and it also protects the tissue.

The ANKYLOS thread is specially designed to match the structure of the bone.

- The cervical geometry reduces load transfer to the cortical bone
- Continuously increasing thread depths transfer loads to the cancellous bone
- Maximum bone-to-implant contact in the final position
- Greatest possible tissue stability with crestal bone maintenance

The design of the thread ensures an even pressure distribution in the bone crest and maintenance of the bone structure.
The structure-maintaining implant design

The growth-activating FRIADENT® plus implant surface

All ANKYLOS C/X implants have the innovative, growth-activating FRIADENT plus microstructure. The properties of the implant surface, which is designed to promote natural bone-healing processes, support the growth of bone-forming cells immediately after implant placement and ensure fast healing of the implants and homogenous osseointegration in the shortest possible time.

FRIADENT plus surface:
• Outstanding wetting properties for activation of the primary cell apposition
• Unique, three-dimensional microdesign that promotes the apposition of bone-forming cells and subsequently optimum osseointegration
• Intensive formation of new bone with increased bone maturation in the early stage for greater stability at the interface
• Improved bone quality for a predictable long-term success rate

Microstructured implant shoulder
The unique patented microstructure on the cervical margin and the implant shoulder promotes the apposition of bone cells. In the case of subcrestal implant positioning this means that bone can form even on the horizontal shoulder area. This provides additional support for the overlying soft tissue.
ANKYLOS® TissueCare connection

The fully friction-locked and keyed ANKYLOS TissueCare connection provides excellent stability between implant and abutment.

The advantages are clear:
• No micromovement between implant and abutment. The virtual single-component implant design prevents mechanical irritation to the bone and maintains the peri-implant bone
• Bacteria-proof connection and therefore significantly reduced risk of infection. The connection, which is designed for a complete seal, prevents bone resorption and ensures healthy, irritation-free tissue
• Platform-switching displaces the transition between implant and abutment from the implant shoulder to a central position. This prevents mechanical and microbial irritation in the peri-implant tissue and provides a wide horizontal base for stable apposition of hard and soft tissue

In combination with
• a subcrestal implant position and
• microroughness of the implants to the interface, the ANKYLOS TissueCare connection offers the best prospects for lasting red-white esthetics.
The prosthetic options

ANKYLOS® TissueCare Concept

The five success factors of the TissueCare Concept:
1. No micromovement between implant and abutment
2. Bacteria-proof connection
3. Platform-switching
4. Subcrestal implant placement
5. Microroughness to the interface

The ANKYLOS TissueCare Concept establishes space for dense, healthy soft tissue and natural looking implant-supported restorations.

For the patient’s prosthetic restoration this means:
• High functional loads, such as in the molar region, are safely transferred
• High security against loosening of retaining screws and abutments
• Cemented superstructure without risk
• Long-term esthetics as a result of functional design

Minimally invasive uncovery

Another advantage of the specially designed tapered connection for the surrounding soft tissue becomes clear when starting the prosthetic restoration.

The gingiva only requires minimal uncovering without extended flap debridement. The hard and soft tissue on the implant margin is maintained.

For the patient, this means:
• Reduced surgical procedure
• Reduced treatment time
• Reduced treatment trauma

In many cases the option of transgingival healing makes a second surgical procedure quite unnecessary.

1 | Stable peri-implant hard tissue and soft tissue after uncovery.
2 | 24 months after prosthetic restoration.
3 | 48 months after prosthetic restoration.
4 | Clinical situation (Photos: Dr. Nigel Saynor, Stockport, UK).
Freely combinable prosthetic abutment components

Prosthetic components for ANKYLOS C/X are available in different sizes and shapes with and without an index. A wide range of prosthetic situations can be managed for the best functional and esthetic results.

The identical size of the tapered connection means that any abutment fits into any implant of any diameter.

This means that
- Any abutment can be combined with any implant
- The number of prosthetic components is significantly reduced
- The options for implant-prosthetic therapy are significantly greater
- The diameter and length of implants can be selected exclusively on the basis of the bone volume
- The prosthetic abutment is selected entirely based on the prosthetic requirements

ANKYLOS® C/X prosthetics

Prosthetic abutments with tapered connection and index can be used when this is feasible. If free orientation of the abutment is of advantage, abutments with only the tapered connection can be used. The tapered connection ensures optimum stability and rotation locking for all components with or without index.

The ANKYLOS C/X prosthetics are:
- Prosthetic abutments with tapered connection and index
- Prosthetic components for ANKYLOS C/X are available in different sizes and shapes with and without an index
- A wide range of prosthetic situations can be managed for the best functional and esthetic results

<table>
<thead>
<tr>
<th>Prosthesis Type</th>
<th>Single-tooth crowns</th>
<th>Fixed bridges</th>
<th>Removable Prostheses</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANKYLOS Regular C/ or /X</td>
<td>x</td>
<td>x</td>
<td>-</td>
</tr>
<tr>
<td>ANKYLOS Balance Anterior C/ or /X</td>
<td>x</td>
<td>x</td>
<td>-</td>
</tr>
<tr>
<td>ANKYLOS CERCON Balance C/</td>
<td>x</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>ANKYLOS Balance Base Abutment C/</td>
<td>-</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>ANKYLOS Standard Abutment C/</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>ANKYLOS SynCone C/</td>
<td>-</td>
<td>-</td>
<td>x²</td>
</tr>
<tr>
<td>ANKYLOS Snap Attachment C/</td>
<td>-</td>
<td>-</td>
<td>x</td>
</tr>
</tbody>
</table>

1 | Single-tooth restoration in the anterior region only (region 13–23 and 33–43)  
2 | Immediate loading only in edentulous mandible on at least four interforaminal implants

All prosthetic abutments are laser-marked to indicate their use
- Components with the C/ mark use only the “C” one for the connection and are not indexed.
- Components with the /X mark are indexed. The index is used to position the abutment components in one of six possible positions.
- Components with the C/X mark are used for indexed or non-indexed prosthetics.

Please note:
All components marked with C/X, C/ or /X fit into ANKYLOS C/X implants. Restorations based on ANKYLOS plus implants require components marked with C/ only or without any markings.
ANKYLOS® implant package

ANKYLOS C/X implants are supplied in double-sterile blister package with an outer carton. This type of package offers the maximum possible product safety in conformance with the increasingly rigid requirements for medical devices. The packaging also makes it easy to store all products for quick retrieval and they are easy to handle during the surgical procedure.

Outer box package

- Simple product classification with brand-specific design, sight window and imprint of the implant diameter
- Seal label with details of products
- Stackable, all important product information remains visible
- Includes multilingual instructions for use
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Transparent outer blister

- Outer sterile barrier of implant package

Transparent inner blister

- Inner sterile package
- Contains implant shuttle with implant and cover screw for implants
- Peel-off label with batch number for reliable documentation of treatment

Plastic implant shuttle

- Holds the implant securely in the packaging and protects it from damage
- Makes non-contact transfer and acceptance of the implant easy during the operation
- Three wings with roughened surfaces for non-slip holding make it very easy to handle safely

Symbols on the package labels

<table>
<thead>
<tr>
<th>SYMBOL</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>STERIL</td>
<td>Sterilization using irradiation</td>
</tr>
<tr>
<td>DO NOT REUSE</td>
<td>Do not reuse</td>
</tr>
<tr>
<td>Manufacturer</td>
<td>Keep away from sunlight</td>
</tr>
<tr>
<td>Keep dry</td>
<td>Keep dry</td>
</tr>
<tr>
<td>Consult instructions for use</td>
<td>Class I medical devices in accordance with Directive 93/42/ECC</td>
</tr>
<tr>
<td>CE 0123</td>
<td>Class IIa, IIb, III medical devices in accordance with Directive 93/42/ECC</td>
</tr>
<tr>
<td>Note for Russia</td>
<td>Russian certification marking in accordance with the Gos standard</td>
</tr>
<tr>
<td>Note for USA</td>
<td></td>
</tr>
</tbody>
</table>

Consult instructions for use

Keep dry

Batch code

Expiration date

Reference number

Relevant symbols see product label
ANKYLOS® surgical kits

All instruments for surgical use of the ANKYLOS system are stored in ANKYLOS surgical kits, which are designed to make all instruments easily accessible and easy to clean and sterilize. The modular components of the trays with the minimum required number of instruments can be supplemented with additional modules for specific diameters.

The light plastic trays with organizers integrated into the cover for holding used instruments define a specific user sequence during surgery. All instruments are securely held in silicone holders.

Practical organizer for used instruments

Removable tray cover for simple handling during surgery

Storage of implant drills in diameter-specific snap-on modules for utmost flexibility

Surgical ratchet, implant drivers and screw drivers clearly arranged

Base plate for stable fixation of the modules

The trays can be thoroughly and easily cleaned in accordance with ISO 17664 – please follow the Instructions for sterilization and instrument care.
The following ANKYLOS surgical kits are available:

ANKYLOS Surgical Kit motor AB:

Includes instruments for motor-driven placement of ANKYLOS A- and B-implants (diameter 3.5 and 4.5 mm).

ANKYLOS Surgical Kit manual AB or ABC:

Includes instruments for placement of ANKYLOS A- and B- or A-, B- and C-implants with manual final preparation. Instruments for motor-driven final preparation are only available for A- and B-implants. Like all other drill modules, a drill module for C- and D-implants (manual) can be ordered separately and added to the kit.
ANKYLOS® instrument set

An essential precondition for a successful implant placement is accurate and atraumatic preparation of the bone at the implant site. The instrument set for the ANKYLOS implant system with its precisely designed shapes is ideal for these requirements.
The implant site is prepared in two steps:

- Preparation until the specified implant-specific diameter has been reached (motor-driven)
- Final preparation of the implant site (motor-driven or manually)

**Preparation up to the implant-specific diameter**

The direction and depth of the implant is specified with internally irrigated, motor-driven instruments. The drills have ring markings to show the depth. The maximum speed of 800 rpm must not be exceeded during this step of the preparation in order to avoid local over-heating of the bone.

The resulting bone necrosis will endanger ankylosis healing of the implant. Drilling should not be conducted in one step but intermittently under moderate pressure. Clear the drill tip from bone chips before every drilling step. Check the coolant flow at the tip of the instrument frequently.
ANKYLOS® instrument set

Preparation until the specified implant-specific diameter is reached

ANKYLOS Tri-Spade Drill (twist drill)

For every implant diameter, Tri-Spade drills in various lengths are available for multiple use. The top edge of the ring markings indicates the implant lengths. The areas between the 8/9.5 mm and 11/14 mm markings are shaded to improve orientation.

The effective drilling depth during preparation is slightly deeper than the specified implant length.

Instead of the Tri-Spade drills, parallel drills with parallel-walled cutters are available for D-implants.
Final preparation of the implant site

The final implant site is prepared by the conical reamer and the tap. Both can be operated motor-driven using the contra-angle hand-piece or manually by ratchet inserts with the adjustable ratchet.

ANKYLOS Conical Reamer
- One reamer per implant diameter and length
- Used for conical expansion of the depth drilling in the crestal region
- Can also be used counterclockwise for bone condensation where bone density is low (manual reamers)

ANKYLOS Tap
- One tap per implant diameter can be used for all implant lengths
- For tapping the implant thread
- It is not necessary to tap the thread where the bone density is significantly reduced

Optional: Depth drilling with disposable drills

As an alternative to the re-usable Tri-Spade drills disposable drills in S and M lengths, which are supplied in sterile condition, are available. This ensures that a new, sharp drill is always available for this very important stage of drilling. They are used in the same way as the Tri-Spade drills.

Disposable drills are supplied in a sterile blister package, with the length and diameter shown on the outer label. The blister cover is removed in the semi-sterile area and passed into the sterile area for use. The disposable drill is designed for single use on one patient.

A previously used or non-sterile drill must not be re-used. Do not interrupt the sterile chain under any circumstances.

Please note:
Only manual reamers and taps are available for C- and D-implants to prevent excessively high torque.
A step can be seen between implant and placement head to indicate the position of the implant shoulder.

The placement head is 3.4 mm in diameter for all implants. Even for narrow gaps, it does not need to be mounted on a different instrument. The placement head does not have a stop during insertion.

**ANKYLOS® instrument set**

**Implant driver**

For implant placement, instruments for motor-driven operation with contra-angle handpieces and instruments for use with the ratchet are available.
ANKYLOS C/X Implant Driver
• Screw-retaining the implants and releasing the placement head without changing instruments
• Available in three lengths (short, medium, long) for manual implant placement

Following implant placement, the straining screw of the placement head can be loosened with the internal screwdriver. A knurl and a pinion square are located at the top end of the screwdriver. These can be used as an aid for loosening the straining screw using the C/X open-end wrench. Lateral counterlocking of the placement head is no longer required using this open-end wrench, since the ratchet insert, together with the ratchet, takes on the locking function in an axial direction.

ANKYLOS Implant Driver
• Two implant drivers (short and long) for contra-angle handpieces with hexagon clamping system (HXSS) and three implant drivers (short, medium, long) for manual use with handle or ratchet are available
• Circle of dots for accurate alignment of implants when using indexed prosthetic components

Please note:
Dots are milled in a circle on the implant driver. When using the indexed abutment components in the prosthetic restoration, note that one of the markings on the implant driver indicates the vestibular direction. If this is not taken into account, problems in the alignment of angled abutments may be encountered when using the positioning aid (index). If the positioning aid will not be used, the implant depth alone must be monitored.
Step-by-step: Preparation of the implant site

Implant site preparation up to the implant-specific diameter is performed with a motor-driven set of instruments with internal irrigation.

Incision

The bone is uncovered by incision. The mucosa and periosteum are mobilized and folded back. The incision direction depends on the case, and the healing mode must also be considered (transgingival or submerged).

Bone smoothening

After mobilization of the mucoperiosteal flap, sharp bone crests are slightly smoothened with the internally irrigated round drill.

The ANKYLOS round drills and the twist drills are operated at max. 800 rpm (revolutions per minute).

Marking the implant position

The surgical template is positioned and the twist drill (optional: Lindemann drill) is used to transfer the implant position to the bone. The titanium sleeve for surgical guides (order no. 3104 5490) can only be used in combination with the 2 mm twist drill.

Please note:
All drills are operated with clockwise rotation unless otherwise specified. Cutting instruments should generally be replaced after 20 cycles of use. Blunt or damaged instruments must be replaced immediately. Make sure that drills and milling tools are adequately cooled inside and outside during preparation. A sufficient flow is guaranteed if the internal and external cooling sources are separate.
Pilot drilling with the twist drill

After removal of the surgical template the direction of the implant is defined with the twist drill. The axial alignment may deviate, within limits, from that of the surgical template depending on the ridge profile. The axial divergence can be compensated subsequently with angled abutments.

Where the bone density is very low (reduced resistance to drill), the bone can be condensed instead of drilling pilot holes (see surgery options, page 22).

Depth drilling

Depth drilling is performed with Tri-Spade drills. The top edge of the ring markings indicates the implant lengths. The Tri-Spade drill A is always used first. When placing B, C or D-implants the cavity is expanded in ascending order of size with the B and C Tri-Spade drills or the D parallel drill. An atraumatic procedure and application of low pressure where the bone density is higher is very important.

Please note: Bone chips may block the openings for internal irrigation during preparation. Particularly when preparing multiple cavities in succession we recommend checking the drill at intervals outside the patient’s mouth to ensure that the coolant is still flowing. Gentle, thorough disinfection and cleaning of the drills will ensure that they operate at their best. Please observe the Instructions for sterilization and instrument care.

Subcrestal implant position

As a result of the internal tapered connection (TissueCare Concept) with sufficient vertical bone volume, the implant can be placed up to 1 mm subcrestally for improved stabilization of the peri-implant bone. This procedure allows healing without loading under the mucosa-supported denture and may improve the prosthetic result in esthetically relevant indication areas.

A planned subcrestal implant position must be considered during the pre-implant planning and when observing of the ring marks on the depth drill.
Expanding with reamers

The depth drilling is expanded conically to fit the implant design. A separate conical reamer is available for every type of implant. They can be operated by motor-driven with the contra-angle handpiece (A and B-implants only) or manually by the ratchet.

Motor-driven operation of the reamer

The reamer is inserted into a handpiece or contra-angle handpiece, if necessary a drill extension is used. The maximum speed is 15 rpm, the maximum torque 60 Ncm. The conical reamer is inserted into the drilled hole and preparation is started with clockwise rotation without high pressure. The non-cutting tip ensures that the drilled hole is not deepened. The reamer is removed from the cavity while still rotating.

Manual operation of the reamer

Reamers and ratchet inserts for instruments are joined to the required length and inserted into the ratchet. The arrow on the switch button of the ratchet shows the direction of rotation. The pins on the open-end wrench assist in guiding the instrument to prevent it from tilting. The conical reamer is inserted into the cavity and preparation is started without pressure. Light pressure should only be applied for the last quarter of the preparation step. The non-cutting tip ensures that the drilled hole is not deepened. The reamer is rotated one revolution counterclockwise before removing it.

Optional: Bone condensation

With reduced bone density the conical reamer can be rotated counterclockwise to improve the bone implant site. This procedure condenses the bone structure in the wall of the cavity (this improves primary stability).
**Tapping the thread**

Taps are selected according to the implant diameter; they can be used for motor-driven tapping with the contra-angle handpiece (A and B-implants* only) or manually with the ratchet.

**Reduced bone density**

It is not necessary to tap the thread if the bone density is significantly reduced (bone class D IV). The progressive thread design of the ANKYLOS implant is designed for self-tapping placement.

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**Measurement**

The reamer is also used as a gauge. After expanding the cavity the top margin of the reamer, depending on the planned implant position (see option: Subcrestal implant position), must stop slightly below the bone surface. If this is not the case, the implant site must be deepened to the required depth with the last used Tri-Spade drill. The cavity is rinsed with physiological saline solution after removal of the reamer.

**Motor-driven operation of the tap**

The tap is inserted into a handpiece or contra-angle handpiece, if necessary a drill extension is used. The maximum speed is 15 rpm, the maximum torque 60 Ncm.

The ANKYLOS thread is prepared clockwise. The depth is checked by the depth markings and the preparation is stopped at the correct depth. Otherwise the thread may be stripped and this will affect the primary stability. On completion of thread preparation the tap is screwed out of the implant site counterclockwise and the cavity is rinsed again with physiological saline solution.

**If the surgical unit in use does not have adequate torque, use manual preparation.**

**Manual operation of the tap**

A version of the tap is available for manual operation. The tap corresponding to the implant diameter is attached to the ratchet insert for instruments to the required length and inserted into the ratchet. The tap is used as described left.
Step-by-step:
Placement of ANKYLOS® C/X implants

ANKYLOS implants are designed for single use only. A previously placed or non-sterile implant must not be used. The implant must not be used after the expiry date. Do not interrupt the sterile chain under any circumstances.

Removing the implant from the packaging

After preparation of the implant site, the implant packaging is opened outside the sterile area and the sealing foil of the outer blister is removed.

Inner blister

The inner blister is removed under sterile conditions and the sealing foil is removed in the sterile area. Peel-off adhesive labels with the batch number are on the sealing foil of the inner blister for subsequent documentation in the patient’s file or the implant passport.

Please note:
Keep the inner blister horizontal with the sealing foil upwards when opening and keep it after removal of the implant holder; it contains the cover screw of the implant, which is mounted after implant placement for submerged healing.
The implant holder, which holds the ANKYLOS C/X implant with the placement head, is removed. The implant holder can be safely transferred with the three wings for holding it.

To remove the implant, the motor-driven or manual implant driver of the required length is inserted into the internal hex of the placement head. Push the implant holder together slightly by the opposite wings to prevent the implant from rotating. Check that the instrument is firmly seated.

The implant can be transferred to the implant driver while remaining under control at all times by slightly bending the parallel wings of the implant holder.
Step-by-step: Placement of ANKYLOS® C/X implants

Please note: To prevent heat necrosis the rotary speed when placing implants must not exceed 15 rpm.

Motor-driven implant placement

After the implant has been removed from the implant holder with the implant driver (motor) fixed in the contra-angle handpiece, it is screwed into the jawbone. The maximum speed is 15 rpm, the maximum torque 50 Ncm. Make sure that no fibrous or epithelial tissue is transferred to the implant site.

If the implant becomes difficult to screw before it reaches the final position, unscrew it and rinse or tap the implant site again.

For the use of indexed abutment components in the prosthetic restoration, note that one of the markings on the implant driver indicates the vestibular direction.

Placing the implant manually

The handle for ratchet insert is attached to the implant driver of the desired length in order to remove the implant from the implant holder. The implant is screwed into the jawbone for about two thirds of its length. Make sure that no fibrous or epithelial tissue is transferred to the implant site.

If the implant becomes difficult to screw before it reaches the final position, unscrew it and rinse or tap the implant site again.
For the use of indexed abutment components in the prosthetic restoration, note that one of the markings on the implant driver indicates the vestibular direction. If this positioning aid will not be used, the implant depth alone must be monitored.

When the implant has reached its final position, check that it is tightly seated, then the implant driver is removed from the placement head (fig. 1). Then hold the placement head with an open-end wrench, straining the clamping screw of the placement head with the 1 mm hex screwdriver with one turn (fig. 2). With a second turn of the screwdriver, the straining screw pushes the placement head out of the implant (fig. 3). Remove the placement head from the oral cavity. When doing so, make sure that the placement head cannot be swallowed or inhaled. In soft bone the placement head must be locked with the C/X open-end wrench to prevent rotation.

The implant can also be seated and screwed in via the placement head with this instrument as described previously. After reaching the final implant position, the screwdriver integrated into the implant driver is used counterclockwise, with the C/X open-end wrench to release the straining screw of the placement head. Then the C/X implant driver is removed from the patient’s mouth using the placement head and ratchet.
ANKYLOS C/X implants allow use of both indexed or non-indexed prosthetics. An ANKYLOS C/X implant can be distinguished from the previous ANKYLOS plus implant by the lack of the four grooves on the implant shoulder.
All prosthetic components for ANKYLOS C/X implants are laser-marked to indicate their use:

- Components marked with "C/" use only the “C” one for the connection and are not indexed. This means that the abutment components can be positioned as desired and are completely locked by the cone to prevent rotation.

- Components marked with "/X" are indexed. The index is used to position the abutment components in one of six possible positions. In this case also the cone guarantees optimum stability and rotation locking.

- Components with the C/X mark are used for indexed or non-indexed prosthetics.

**Please note:**
ANKYLOS C/X implants must only be used with components that are laser-marked with "C/X" "C/" or "/X", or that belong to the following product groups. ANKYLOS Balance Anterior and Posterior abutments and repositioning posts, ANKYLOS CERCON Balance, temporary abutments Balance, sulcus formers Balance Anterior and SynCone abutments.

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**Correction of the implant position**

If it is necessary to correct the vertical implant position after disassembly of the placement head, the placement head must be mounted again. Replace it in the implant, find the orientation of the positioning aid, click it into position, and then hand-tighten the straining screw of the placement head (max. 1.5 Ncm). Then reposition the implant driver (manual or motor-driven) and correct the vertical implant position.

To use the indexed abutment components in the prosthetic restoration, note that one of the markings on the implant driver indicates the vestibular direction.
Step-by-step: Transgingival healing

With transgingival healing of the implants, a second surgical procedure is not necessary. At the same time, you take optimal advantage of the regeneration potential of the soft tissue for creating a perfect emergence profile. The implant is closed with a gingiva former for transgingival healing. The geometry of the subsequent prothetic restoration can be taken into account even when selecting the diameter. Because the gingiva former is a separate component from the implant, an abutment with a different emergence profile can be selected if the gingival margin changes during the healing phase to retain the esthetics.

Screwing in the gingiva former

If transgingival healing is planned for the implant, a gingiva former of the same thickness as the soft tissue must be placed after removal of the placement head.

Hand-tighten the gingiva former with the 1 mm hexagon screwdriver.

Suturing

The edges of the wound are shaped to the gingiva former and fixed by a vertical mattress suture.

Please note:

- Gingiva formers are supplied non-sterile and must be sterilized before use.
- Make sure that the surface of the taper connection is clean prior to the installation of the cover screw, gingiva former or abutment.
- For a temporary restoration with a partial or full denture make sure that there is no contact between the gingiva former and the temporary denture.
The implant healing phase is generally three to four months regardless of the location in the maxilla and mandible. One exception is augmentation procedures conducted simultaneously; the healing phase must be extended for a single-stage procedure.

Step-by-step: Submerged healing

Placing the cover screw

If the implant is planned for submerged healing, the cover screw must be placed after removal of the placement head. Remove the cover screw from the inner blister with the 1 mm hex screw-driver and screw it hand-tight into the implant with approx. 6 Ncm.

Suturing

The alveolar ridge is closed by sutures to prevent ingress of saliva. The sutures must be under as little tension as possible. The implant site is documented by a postoperative x-ray image. The implant must not be loaded during the healing phase.
Step-by-step: Immediate restoration with short-term temporary denture

In case the clinical preconditions for immediate restoration with a short-term temporary are favorable, your patient can benefit from the integration of an implant-supported restoration right after implant placement. A second surgical procedure is not required, your patient sees a result immediately and you take optimum advantage of the regeneration potential of the soft tissue for creating a perfect emergence profile.

**Short-term temporization**

The temporary restoration is fabricated on the ANKYLOS Balance temporary abutment. The large Balance temporary abutment may be ground down maximally to the size of the small Balance temporary abutment. The small Balance temporary abutment must not be customized by grinding. For grinding, cross-toothed tungsten carbide cutters are used with up to 25,000 rpm. Grinding should be done outside of the mouth.

**Delivery of short-term temporary**

Clean and dry the taper connection of the implant with air/water spray prior to placing the abutment. The abutment is tightened using the 1 mm hexagon screwdriver with the prosthetic ratchet or a torque-controlled contra-angle handpiece with 15 Ncm. The temporary suprastructure is cemented with provisional cement. Please remove all excess cement at the crown margin. Make sure tight suturing to prevent ingress of saliva.

**Immediate loading with SynCone**

There is the option of fabricating an immediately loaded prosthesis on prefabricated SynCone C/ tapered crowns on no fewer than four ANKYLOS implants placed interforaminally in the mandible.

For details please see the SynCone manual.
Further treatment

Please note:
Short-term temporaries must be replaced after 6 months latest.
Step-by-step: Minimally invasive uncovery

The implants are uncovered generally after three to four months in submerged healing. The great advantage of the tapered connection becomes evident in this step. The horizontal offset of the implant-abutment connection towards central makes it possible to open the gingiva with a minimally invasive procedure without extended flap debridement. The procedure should be as atraumatic as possible to ensure that as little hard and soft tissue around the implant as possible is lost.

Locating the implants may be facilitated by again using the drill guide.

Incision

After locating the implant and local anesthesia directly above the implant (e.g. intraligamentary system), make a limited crestal incision on the implant surface.

Uncovery

Then the edges of the wound are slightly spread with an angled raspatory (1) without exposing the complete surface of the implant. The central thread of the cover screw is located with the probe (2). Remove connective tissue or bone over the cover screw with the sharp curette (3).
Removing the cover screw

The probe is replaced with the unscrew instrument. Insert the unscrew instrument for cover screws into the large 12 mm diameter handle for screwdriver and screw it counterclockwise into the internal thread of the cover screw under light pressure. The unscrew instrument grips the internal thread of the cover screw and screws it out.

This prepares the implant for fitting the gingiva-forming components. To remove the cover screw from the unscrew instrument the cover screw is clamped extraorally in the back of tweezers or the needle holder or gripped with pliers. Then the unscrew instrument is rotated clockwise until it comes away from the cover screw.

Placing gingiva former

The appropriate gingiva-forming component (gingiva former C/X, sulcus former) is selected depending on the selected prosthetic restoration. All gingiva formers are available in different geometries for an optimum fit with the anatomical conditions. After selection of the correct component it is placed in the implant and screwed into the internal thread of the implant with the screwdriver insert 1.0 mm hex fixed in the handle. The gingiva formers remain in situ for about two weeks.

Please note:
In each case, finally use the gingiva/sulcus former suitable for the respective abutment. Only this will ensure the optimal contouring of the soft tissues and hence the required fit and stability for the prosthetic abutment. Gingiva/sulcus formers should be sterilized prior to use.
Indication
Implant site in the maxilla with sufficient vertical bone volume and retained cancellous intermediate zone between labial and palatal cortical lamella. The dentist with surgical experience can achieve excellent predictable results with this technique. It is important to note that the procedure described is not suitable for increasing the vertical bone volume.

Incision direction and flap design
The incision direction is offset in the palatal direction. In the labial direction the periosteum is not debrided to retain the vascular supply of the cortical bone lamella.

Marking the alveolar ridge
The center of the alveolar ridge is marked with a strong scalpel blade to define the plane in which the two cortical lamellae will be separated from each other. The exact position for the osteotomy is selected with the position marker.
If the horizontal bone volume is reduced the implant site can be expanded by bone expansion and bone condensation, making additional augmentation procedures unnecessary. Permanent esthetic results are achieved by reconstruction of the resorbed labial bone wall.

**ANKYLOS® BoneExpander**

The D-shaped cross-section of the instrument is ideal for separating the labial and palatal bone lamellae and placing the implants in a single session. The labial and palatal cortical lamellae are separated with the BoneExpanders using a surgical mallet with controlled application of force. The instruments are used in four widths in increasing order of width to separate the cortical bone lamellae evenly and carefully. The convex surface of the D-shaped profile of the instrument points to the labial side, while the flat side of the instrument supports the palatal bone lamella to prevent extreme tension in the region of the labial cortical bone lamella.

**ANKYLOS® BoneCondenser**

The rounded cross-section is designed for the lengths and diameters of ANKYLOS implants. The bone shaping starts using controlled application of force, with a surgical mallet if necessary, with the position marker, followed by the Pilot BoneCondenser. Then, depending on the desired implant diameter, the three BoneCondensers are used in ascending size and the rounded profiles form the bone cavity for the desired implant diameter. In soft bone implants of diameters 3.5, 4.5 and 5.5 mm can be placed without requiring the use of a tap. The BoneCondensers can also be used for an internal sinus lift.

**Healing phase**

The provisional restoration of the patient is adjusted to the increased volume of the expanded alveolar ridge.

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Please note:
There must be absolutely no mechanical irritation or pressure on the soft tissue. The healing phase should be extended to six months.
ANKYLOS® sinuslift instruments

The ANKYLOS sinus lift instruments by Professor Dr. G.-H. Nentwig (Frankfurt) and Dr. A. Sethi (London) are based on the many years of practical experience of these two practitioners with the sinus lift technique. A series of seven instruments with double ends makes selection and the surgical procedure easy for the surgeon. The hollow handles make the instruments very light and they are ergonomically designed. They are comfortable to hold and allow sensitive handling. Use the sharp working tips to lift the sinus mucosa carefully. All instruments are numbered on the handle and laid out logically in a surgical tray.

Surgical procedure

Appropriate training with practical exercises is essential for safe handling of the instruments. The following notes on the use of the instruments are guidelines only.

The instruments are selected so the tip of the instrument follows the floor of the maxillary sinus. This makes it easy to separate the sinus mucosa cleanly without perforation.

Instrument 1
- For flap debridement
- Sharp claw for mobilization of the interdental papillae
- Flat side for accurate lifting of the periosteum

Instrument 2
- For flap debridement
- Curved curette (180 degree) for flap debridement in inaccessible palatal sections, preparation of bone septa and for starting preparation of the maxillary sinus membrane
- Plate curette for universal application and for lifting the periosteal membrane

Instrument 3
- 180-degree curved side for mobilizing the sinus mucosa in the anterior region of the window and the floor of the maxillary sinus
- 45-degree curved side for mobilizing the sinus mucosa from the distal wall of the maxillary sinus and side wall of the nose. Also for removal of granular material

Instrument 4
- Narrow tips for unhindered access even in narrow regions
- Single curved tips (90 degrees) for access along the floor of the maxillary sinus during distal preparation
- Double curved tips (180 degrees) for mobilizing the sinus mucosa mesial from the window and on the floor of the maxillary sinus

Instrument 5
- Like instrument 4 but with wider tips
- Can also be used to protect the sinus mucosa during simultaneous implant placement

Instrument 6
- One end curved right and the other end curved left
- For access to the mesial, distal, superior and inferior regions at the margin of the bone window
- For continuing preparation of the sinus mucosa and for preparation of bone septa

Instrument 7
- Riffled ends of different diameters for folding in the bone window that was previously prepared with a round drill
- Narrower end for point use at the margin of the window, wider end for the center
- Recommended for use with a 300 g mallet; a mallet with a riffled working surface is optionally available

Postoperative care

The same treatment as after surgical closure of an oral-antro connection (MAV) is indicated. Nose-blowing must be avoided until removal of the sutures. Nose drops to reduce swelling are recommended. Oral hygiene can be maintained in the first seven to ten days after the operation by rinsing the mouth with a suitable oral antiseptic solution. Mechanical loads on the implant region must be avoided after the operation.
ANKYLOS® membrane screws

Extra-flat membrane screws can be used to fix the membrane when using the GBR technique. They are screwed into the thread of the cover screw of the closed implant. In this case the implant should not be placed subcrestally.

Four membrane screws are available:

Ø 3.5 mm:
For fixing the membranes on all implant diameters:
• use with the screwdriver insert 1.6 mm blade

Ø 6.0 mm:
For fixing membranes with improved shielding effect:
• also after single-stage sinus lift for additional securing of A-implants
• use with the screwdriver insert 1.6 mm blade

Ø 6.0 mm:
Two membrane screws for sinus lift:
• Cylinder of 1 or 2 mm between thread and screw face for fastening implants to osteosynthesis plates after single-session sinus lift
• Use with 1.0 mm hexagon screwdriver
About DENTSPLY Implants

DENTSPLY Implants offers comprehensive solutions for all phases of implant therapy, including ANKYLOS®, ASTRA TECH Implant System™ and XiVE® implant lines, digital technologies, such as ATLANTIS® patient-specific CAD/CAM solutions and SIMPLANT® guided surgery, regenerative solutions, and professional development programs. DENTSPLY Implants creates value for dental professionals and allows for predictable and lasting implant treatment outcomes, resulting in enhanced quality of life for patients.

About DENTSPLY International

DENTSPLY International Inc. is a leading manufacturer and distributor of dental and other healthcare products. For over 110 years, DENTSPLY’s commitment to innovation and professional collaboration has enhanced its portfolio of branded consumables and small equipment. Headquartered in the United States, the Company has global operations with sales in more than 120 countries.