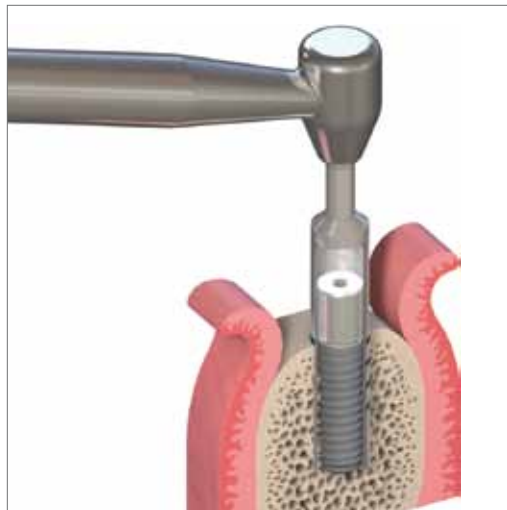


GUIDANCE FOR
IMPLANT REMOVAL



Straumann® Dental Implant System



The ITI (International Team for Implantology) is academic partner of Institut Straumann AG in the areas of research and education.

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1. ABOUT THIS GUIDE

Straumann® implants have been extensively researched, clinically tested and successfully used. The optimized design follows a philosophy called Bone Control Design™, which is based on the five biological key principles in implant dentistry:

- Osteoconductivity of the implant surface
- Control of the microgap
- Biomechanical implant design
- Biological distance
- Position of the surface interface

With the Bone Control Design™, Straumann® implants are designed to achieve optimal preservation of crestal bone and soft tissue stability.

However, there might be circumstances that require a removal of an implant. In the event a removal of a Straumann® implant is needed, this guide provides rules and instructions. It is valid for the whole Straumann® Dental Implant System*.

This guide contains two major sections: Removal of non-osseointegrated implants and removal of osseointegrated implants.

Note

It is the clinicians' responsibility to assess the extent of osseointegration at the time of the planned removal.

Warning

The descriptions given are insufficient to allow immediate use of the Straumann® Dental Implant System. Guidance in the handling of the Straumann® Dental Implant System by an operator experienced in its use is strongly recommended. Straumann® implants must only be used by dentists, doctors, and operators trained in the use of the system. The ITI and Institut Straumann AG hold regular training courses.

* Straumann® ceramic implants excluded.

Straumann products must be secured against aspiration and swallowing when used intraorally. Do not use damaged or blunt instruments. Always inspect instruments before use. The Straumann® 48h Explantation device for the Straumann® Dental Implant System may only be used for the explantation of non-osseointegrated Straumann® implants.

 **Caution**

Federal law restricts this device to sale by or on the order of a dental professional.

2. GUIDANCE FOR IMPLANT REMOVAL



2.1 Removal of non-osseointegrated implants




In principle, tools for the removal of non-osseointegrated implants can be used within 48 hours after implant insertion. It is the clinicians' responsibility to assess the extent of osseointegration at the time of the planned removal.

2.1.1 Potential situations that might require the removal of non-osseointegrated implants

- Surgical complications
- Sub-optimal position with or without broken transfer piece
- Infection of the surrounding tissue
- Patient's wish

2.1.2 Devices required for the removal of non-osseointegrated implants

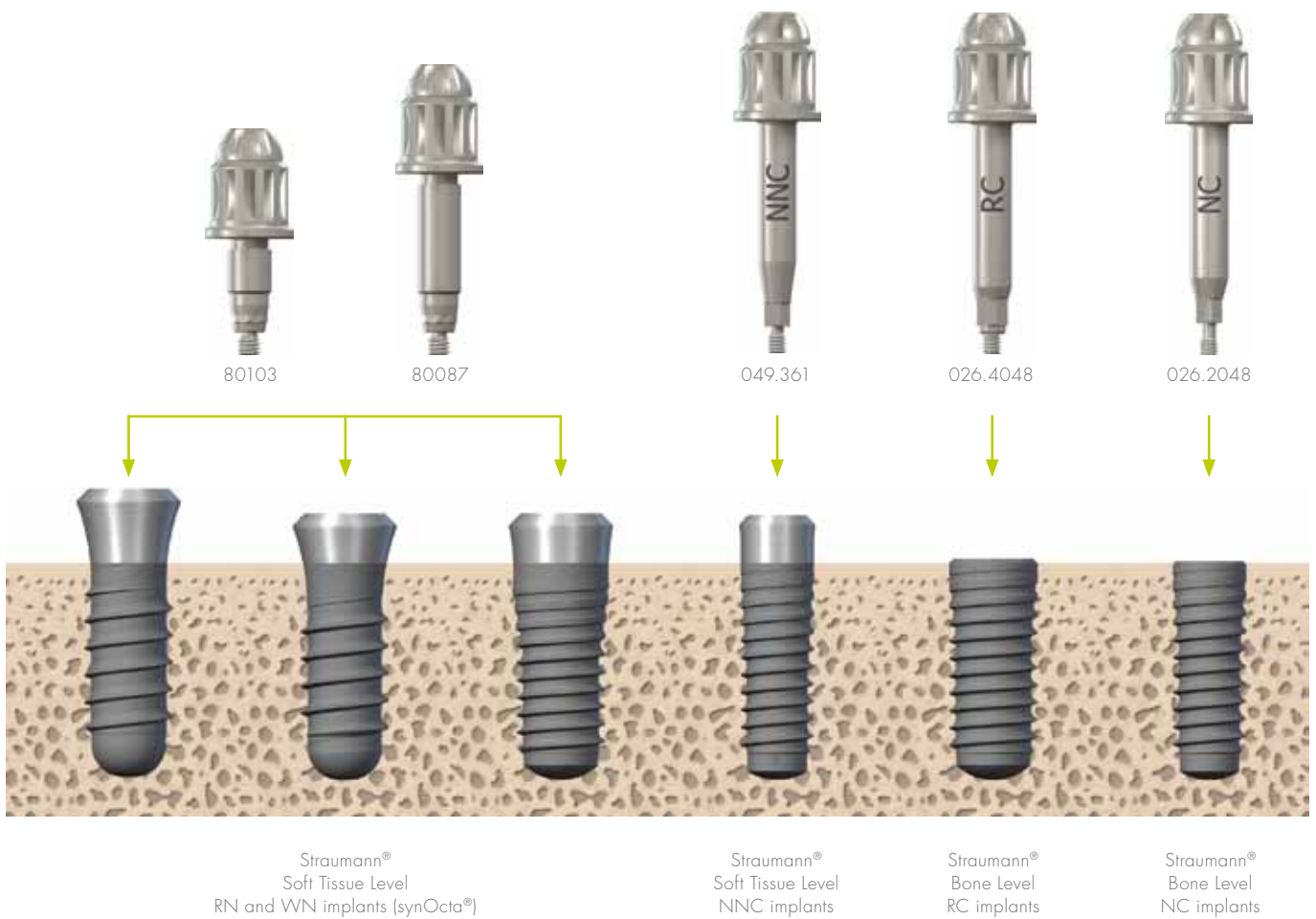
Explantation devices for Straumann® Bone Level implants			
Art. No.		Article	Dimensions
026.2048		48 h Explantation device for NC implants	Ø 8.0 mm Length 31.4 mm
026.4048		48 h Explantation device for RC implants	Ø 8.0 mm Length 31.2 mm

Explantation devices for Straumann® Tissue Level implants			
Art. No.		Article	Dimensions
049.361		48 h Explantation device for NNC implants	Ø 8.0 mm Length 31.4 mm
80103		48 h Explantation device for RN/WN (synOcta®) implants, short	Ø 8.0 mm Length 20.6 mm
80087		48 h Explantation device for RN/WN (synOcta®) implants, long	Ø 8.0 mm Length 26.6 mm

No 48 h Explantation device for NN implants available

Note

- The Straumann® 48 h Explantation devices must neither be used for adjusting the rotational position of the implant nor its height. Otherwise the internal connection could be damaged.
- The Straumann® 48 h Explantation devices may only be used for the explantation of non-osseointegrated implants.



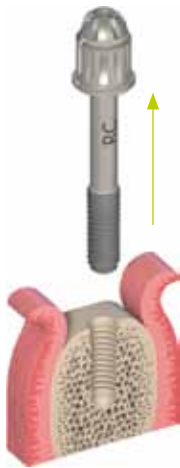
2.1.3 Step-by-step instruction for removal of non-osseointegrated implants

There are several surgical techniques for the removal of non-osseointegrated implants. The procedure shown below is recommended by Straumann.

Bone Level	Soft Tissue Level
<p>Step 1</p>	<p>Step 1</p>
<p>Position the device into the internal connection of the implant.</p> <p>Hand-tighten it to the implant with the fixation screw which secures the implant against aspiration.</p> 	<p>Position the device into the internal connection of the implant.</p> <p>Hand-tighten it to the implant with the fixation screw which secures the implant against aspiration.</p> 
<p>Step 2</p>	<p>Step 2</p>
<p>Use the ratchet (Art. No. 046.119) and holding key (Art. No. 046.064) to slowly unscrew the implant by applying force counterclockwise to the 48 h Explantation device. The holding key is used for stabilization.</p> 	<p>Use the ratchet (Art. No. 046.119) and holding key (Art. No. 046.064) to slowly unscrew the implant by applying force counterclockwise to the 48 h Explantation device. The holding key is used for stabilization.</p> 

Step 3

Remove and dispose the tool with the implant.



Step 3

Remove and dispose the tool with the implant.



⚠ Warning

Removed implants must not be reused! The connection configuration of the implant might be damaged after usage of the 48 h Explantation device which may impact the prosthetic restoration.

2.1.4 Removal of a fractured transfer piece

A broken transfer piece is a result of a too high torque. The predetermined breakage point protects the implant against deformation.

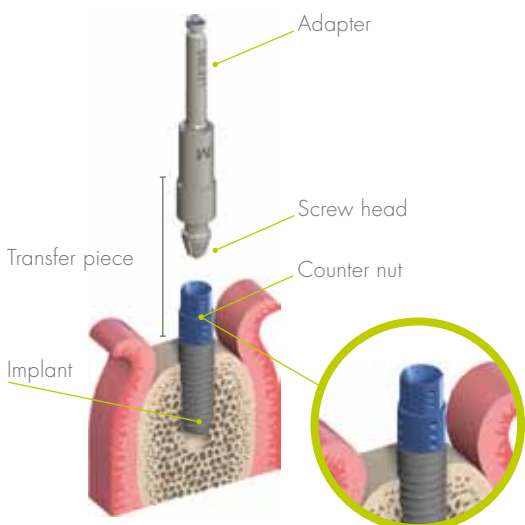
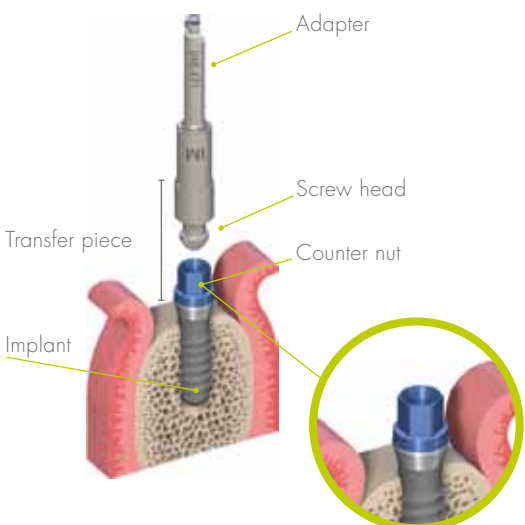
In case of fracture of the transfer piece, the following additional steps (steps Oa, Ob and Oc) are required first, followed by the general procedure shown in Step 1, Step 2 and Step 3 (see pages 15–18).




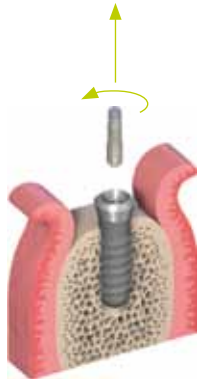
Note

If the implant is positioned correctly, only the broken transfer piece has to be removed. The implant can be kept.

Caution

Small parts can be swallowed or aspirated. Make sure the counter nut is not aspirated or swallowed! As a protection, the use of rubber dam or a fixation with dental floss is recommended.

Bone Level	Soft Tissue Level
Step Oa	Step Oa
<p>Remove the adapter with the screw head.</p> 	<p>Remove the adapter with the screw head.</p> 

Bone Level	Soft Tissue Level
<p>Step 0b</p> <p>Remove the counter nut from the implant. Unscrewing is not needed.</p> <p>In case of jamming, turn the counter nut counterclockwise with the holding key until it loosens. Then remove the counter nut.</p> 	<p>Step 0b</p> <p>Remove the counter nut from the implant. Unscrewing is not needed.</p> <p>In case of jamming, turn the counter nut counterclockwise with the holding key until it loosens. Then remove the counter nut.</p> 
<p>Step 0c</p> <p>Remove the remaining screw, which is still fixed with the implant by tweezers, artery forceps or by hand with counterclockwise rotations.</p> 	<p>Step 0c</p> <p>Remove the remaining screw, which is still fixed with the implant by tweezers, artery forceps or by hand with counterclockwise rotations.</p> 

Then follow steps 1–3 as described on page 6 and 7.

2.2 Removal of osseointegrated implants

It is the clinicians' responsibility to assess the extent of osseointegration at the time of the planned implant removal.

2.1.1 Potential situations that might require the removal of osseointegrated implants

- Unsatisfactory osseointegration
- Peri-implantitis
- Infection of the surrounding tissue
- Sub-optimal position of the implant
- Patient's wish

2.2.2 Devices required for the removal of osseointegrated implants

For the removal of an osseointegrated Straumann® dental implant an explantation drill as well as the corresponding explantation aid is needed.




Explantation drills

Make sure that the length of the inner bore of the explantation drill is longer than the overall length of implant and explantation aid. Otherwise a full immersion of the explantation drill into the bone is not possible.




Explantation drill length	Maximum implant length		
	BL implants.	S implants	SP implants
Short drill	10 mm	6 mm	8 mm
Medium drill	all lengths	12 mm	14 mm
Long drill	for all implant lengths		

Choose diameter of the explantation drill according to endosteal implant diameter. For TE implants choose explantation drills for Straumann® Dental implants Ø 4.8 mm. Note, there is no drill for the TE WN implant (with shoulder Ø 6.5 mm).




Explantation drills for Straumann® dental implants Ø 3.3 mm

Art. No.		Article	Dimensions	Speed
044.330		Explantation drill, short	Inner Ø 3.6 mm Outer Ø 4.2 mm Overall length 32 mm	max. 400 rpm
044.331		Explantation drill, medium	Inner Ø 3.6 mm Outer Ø 4.2 mm Overall length 37.5 mm	max. 400 rpm
044.332		Explantation drill, long	Inner Ø 3.6 mm Outer Ø 4.2 mm Overall length 40.5 mm	max. 400 rpm

Explantation drills for Straumann® dental implants Ø 4.1 mm

Art. No.		Article	Dimensions	Speed
044.340		Explantation drill, short	Inner Ø 4.2 mm Outer Ø 4.8 mm Overall length 32 mm	max. 300 rpm
044.341		Explantation drill, medium	Inner Ø 4.2 mm Outer Ø 4.8 mm Overall length 37.5 mm	max. 300 rpm
044.342		Explantation drill, long	Inner Ø 4.2 mm Outer Ø 4.8 mm Overall length 40.5 mm	max. 300 rpm

Explantation drills for Straumann® dental implants Ø 4.8 mm






Art. No.		Article	Dimensions	Speed
044.344		Explantation drill, short	Inner Ø 4.9 mm Outer Ø 5.5 mm Overall length 32 mm	max. 200 rpm
044.345		Explantation drill, medium	Inner Ø 4.9 mm Outer Ø 5.5 mm Overall length 37.5 mm	max. 200 rpm
044.346		Explantation drill, long	Inner Ø 4.9 mm Outer Ø 5.5 mm Overall length 40.5 mm	max. 200 rpm

Explantation aids

Explantation of Soft Tissue Level implants without abutment			
Art. No.		Article	Dimensions
049.182		SCS Guiding cylinder, for Straumann® dental implants Ø 3.3 mm Narrow Neck (NN)	Ø 3.6 mm Length over implant shoulder 5 mm
049.360		SCS Guiding cylinder, for Straumann® dental implants Ø 3.3 mm Narrow Neck CrossFit® (NNC)	Ø 3.6 mm Length over implant shoulder 4.5 mm
049.082		SCS Guiding cylinder, for Straumann® dental implants Ø 3.3 mm Regular Neck (RN)	Ø 3.6 mm Length over implant shoulder 5.5 mm
049.083		SCS Guiding cylinder, for Straumann® dental implants Ø 4.1 mm Regular Neck (RN)	Ø 4.2 mm Length over implant shoulder 5.5 mm
049.167		SCS Guiding cylinder, for Straumann® dental implants Ø 4.8 mm Regular and Wide Neck (RN and WN)	Ø 4.9 mm Length over implant shoulder 5.5 mm

Explantation of Soft Tissue Level implants without abutment			
Art. No.		Article	Dimensions
026.2801		NC Guiding cylinder, for explantation of Ø 3.3 mm Bone Level implants	Ø 3.6 mm Length over implant shoulder 4.5 mm
026.4801		RC Guiding cylinder, for explantation of Ø 4.1 mm Bone Level implants	Ø 4.2 mm Length over implant shoulder 4.5 mm
026.6801		RC Guiding cylinder, for explantation of Ø 4.8 mm Bone Level implants	Ø 4.9 mm Length over implant shoulder 4.5 mm

**In case the abutment cannot be removed, use the following guiding sleeves
(only available for RN and WN implants):**

Explantation of Soft Tissue Level implants with abutment (only RN and WN)			
Art. No.		Article	Dimensions
049.850		Guiding sleeve, for Straumann® dental implants, Ø 3.3 mm Regular Neck (RN)	Ø 3.6 mm Length 4.5 mm
049.071		Guiding sleeve, for Straumann® dental implants, Ø 4.1 mm Regular Neck (RN) and monotype implants	Ø 4.2 mm Length 5.6 mm
049.851		Guiding sleeve, for Straumann® dental implants, Ø 4.8 mm Regular and Wide Neck (RN and WN)	Ø 4.9 mm Length 6.4 mm
048.350		SCS Occlusal screw, short for screw-retaining of guiding sleeves on a cone abutment 6° or 8° and on monotype implants	Length 4.4 mm
049.181		SCS Occlusal screw, long for screw-retaining of guiding sleeves on an Octa, synOcta® or cone abutment 15°	Length 7.6 mm

No explantation aids for implants with abutment available for NN, NNC, NC and RC implants.

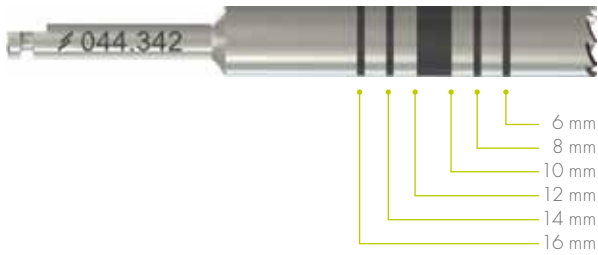


Note

- For Straumann® Soft Tissue Level implants, the overlapping implant shoulder needs to be ground with an appropriate grinding device (e.g. diamond bur) before explantation. The explantation drill can be used for controlling the fit. The grinding is not necessary for NN implants.

- Alternatively, the guiding cylinder may be used for guiding the grinding device.

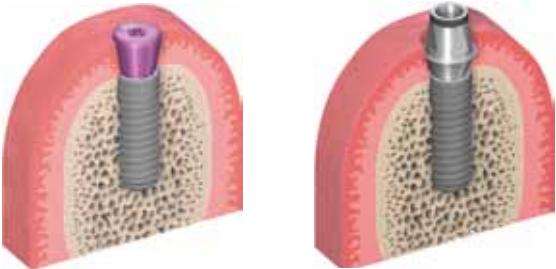
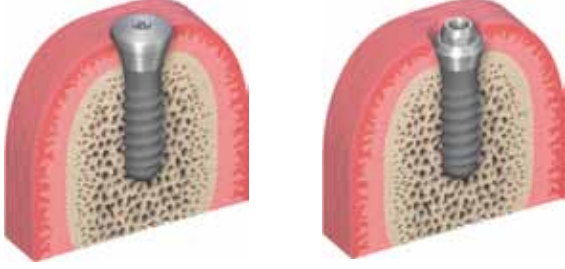
- Always try to remove the abutment and use the guiding cylinders instead of the guiding sleeves.
- SCS screwdriver (see Straumann catalog) is needed to hand-tighten the appropriate explantation aid.
- The guiding sleeves can be cemented onto solid abutments.
- The guiding sleeves cannot be used in combination with angled abutments.
- The explantation drills and explantation aids are intended for single use only.







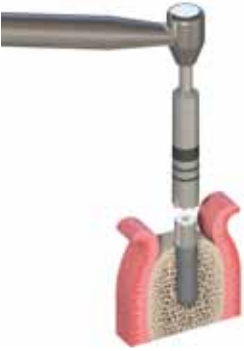


Depth coding/markings on the explantation drills




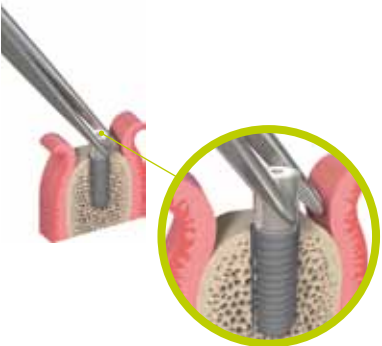


The explantation drills feature a depth coding that allows evaluating the endosteal drilling depth. The first marking on the explantation drill starts at 6 mm. The other markings follow in 2 mm distances. The space between 10 mm and 12 mm is filled.

2.2.3 Step-by-step instruction for removal of osseointegrated implants

Bone Level	Soft Tissue Level
<p>Step 1</p> <p>Remove the healing cap or the abutment.</p> 	<p>Step 1</p> <p>Remove the healing cap or the abutment.</p>  <p>In case the abutment cannot be removed, go to Step 2b, otherwise go to Step 2a.</p>

Bone Level	Soft Tissue Level	
Step 2	Step 2a	Step 2b
<p>Incise the mucosa to gain good access for the procedure.</p> 	<p>Incise the mucosa to gain good access for the procedure. If preferred and possible, this step can be done after grinding.</p> 	<p>Incise the mucosa to gain good access for the procedure. If preferred and possible, this step can be done after grinding.</p> 
	<p>Grind the overlapping part of the implant (not necessary for NN implants) with an appropriate grinding device (e.g. diamond bur) in order to prepare the implant for the removal. Ensure ample cooling of the grinding device. Remove the debris with a surgical aspirator.</p> 	<p>Grind the overlapping part of the implant with an appropriate grinding device (e.g. diamond bur) in order to prepare the implant for the removal. Ensure ample cooling of the grinding device. Remove the debris with a surgical aspirator.</p> 

Step 3	Step 3a	Step 3b
<p>Hand-tighten the appropriate guiding cylinder using the SCS screwdriver.</p> 	<p>Hand-tighten the appropriate guiding cylinder using the SCS screwdriver.</p> 	<p>Hand-tighten or cement (for solid abutments) the appropriate guiding sleeve on the top of the abutment.</p> 
Step 4	Step 4a	Step 4b
<p>Choose the explanation drill and position it over the guiding cylinder.</p> 	<p>Choose the explanation drill and position it over the guiding cylinder.</p> 	<p>Choose the explanation drill and position it over the guiding sleeve.</p> 

Step 5	Step 5a	Step 5b
<p>Mill out the implant with the aid of the explantation drill. Use irrigation to avoid overheating of the bone.</p> 	<p>Mill out the implant with the aid of the explantation drill. Use irrigation to avoid overheating of the bone.</p> 	<p>Mill out the implant with the aid of the explantation drill. Use irrigation to avoid overheating of the bone.</p> 
Step 6	Step 6a	Step 6b
<p>Remove the implant using tweezers or dental forceps by gentle rotation.</p> 	<p>Remove the implant using tweezers or dental forceps by gentle rotation.</p> 	<p>Remove the implant using tweezers or dental forceps by gentle rotation.</p> 

⚠ Warning

Removed implants and devices must not be reused!

3. FURTHER INFORMATION

3.1 Care and maintenance

Some of the instruments mentioned in this guide are delivered sterile, some of them are delivered non-sterile. Please take notice of the product label.

Detailed information regarding sterilization methods can be found in the brochure "Care and maintenance of surgical and prosthetic instruments", Art. No. 152.008.

4. IMPORTANT GUIDELINES

Please note

Practitioners must have appropriate knowledge and instruction in the handling of the Straumann CAD/CAM products or other Straumann products ("Straumann Products") for using the Straumann Products safely and properly in accordance with the instructions for use.

The Straumann Product must be used in accordance with the instructions for use provided by the manufacturer. It is the practitioner's responsibility to use the device in accordance with these instructions for use and to determine, if the device fits to the individual patient situation.

The Straumann Products are part of an overall concept and must be used only in conjunction with the corresponding original components and instruments distributed by Institut Straumann AG, its ultimate parent company and all affiliates or subsidiaries of such parent company ("Straumann"), except if stated otherwise in this document or in the instructions for use for the respective Straumann Product. If use of products made by third parties is not recommended by Straumann in this document or in the respective instructions for use, any such use will void any warranty or other obligation, express or implied, of Straumann.

Availability

Some of the Straumann Products listed in this document may not be available in all countries.

Caution

In addition to the caution notes in this document, our products must be secured against aspiration when used intraorally.

Validity

Upon publication of this document, all previous versions are superseded.

Documentation






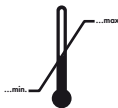








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Explanation of the symbols on labels and instruction leaflets

	Batch code
	Catalogue number
	Sterilized using irradiation
	Lower limit of temperature
	Upper limit of temperature
	Temperature limitation
Rx only	Caution: Federal law restricts this device to sale by or on the order of a dental professional.
	Do not re-use
	Non-sterile
	Caution, consult accompanying documents
	Use by
	Keep away from sunlight
	Straumann Products with the CE mark fulfill the requirements of the Medical Devices Directive 93/42 EEC
	
	Consult instructions for use

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