CAD-CAM
User Manual

adin

From Scan to Smile

Technology has revolutionized the way we understand the world, and dentistry is no exception.
New technologies have made it possible to improve the efficiency and personalization of dental care.

Digital impressions, CAD design, and 3D printing can now create a perfect reproduction of a patient's mouth within hours, compared to the several days that it used to take. This has led to significant improvements in efficiency, as dentists can now spend less time on manual tasks and more time with patients.

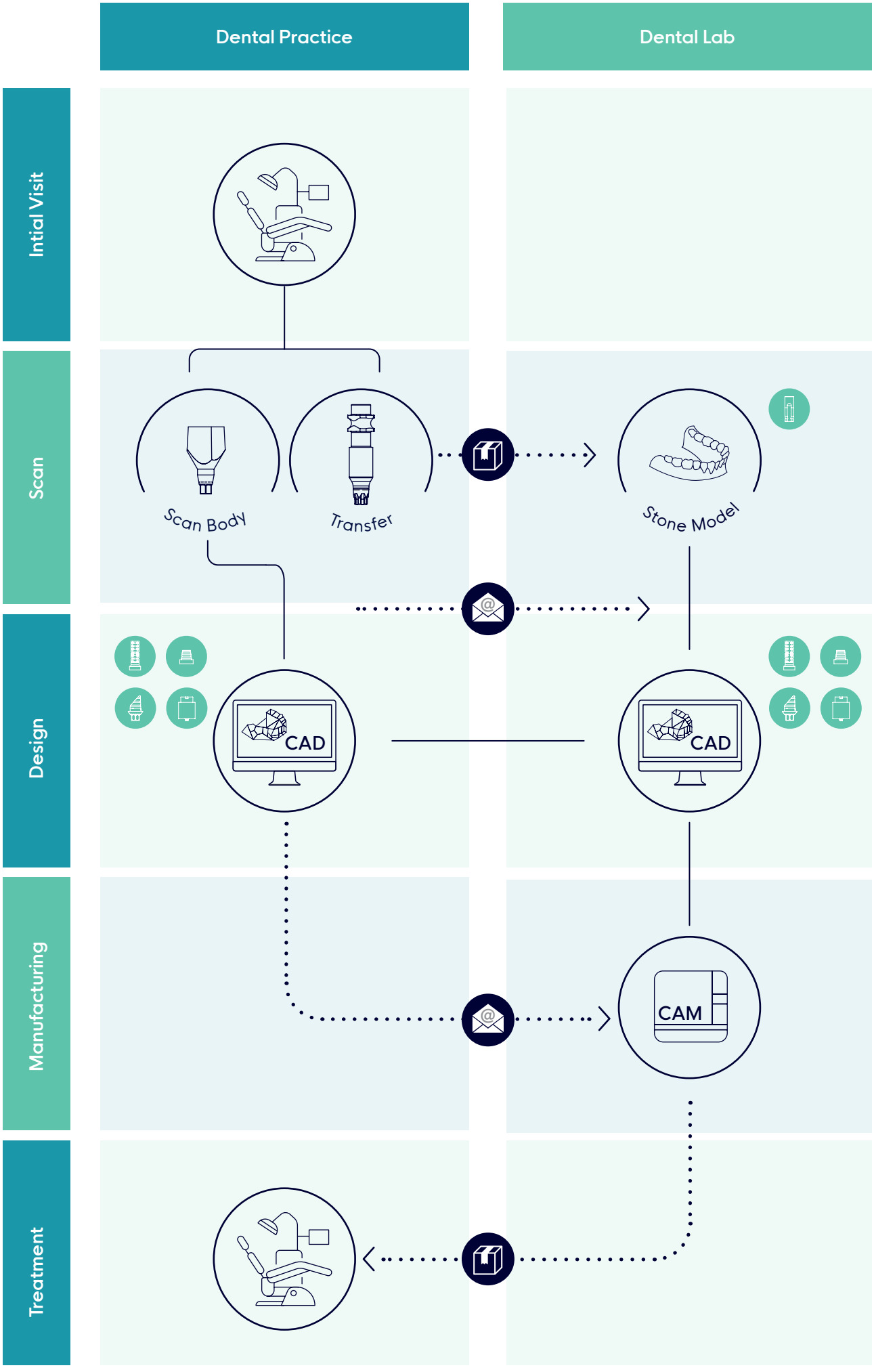
In addition, digital technologies allow for greater personalization of dental care.
No two patients are alike, and each treatment can be tailored to the individual's needs.
This is made possible by the use of 3D scanners and milling machines, which can create custom-made restorations that are perfectly fitted to the patient's mouth.

The use of new technologies in dentistry has led to a number of benefits for patients, including:

Shorter treatment times

Improved cosmetic results

As technology continues to advance, it is likely that we will see even more improvements in the efficiency and personalization of dental care in the years to come.


Dental Practice
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Scan Body

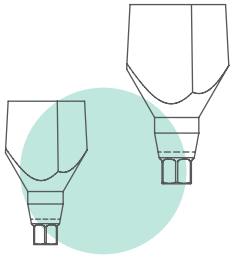
The Scan Body is a component used as a digital transfer for intraoral scanner and other scanners.

The unique geometry and texture of Adin's Scan Bodies optimize the effectiveness of the scanning process.

Scan Bodies are available for all of Adin's implant connection platforms & for Adin's TMA abutments – differing in height to accommodate all clinical scenarios.

Features:

- Soild unique geometric design for scanning between teeth & special texture validated for powder-less scanning procedure
- Titanium alloy material is used to achieve a durable and accurate component
- Innovative 3D scan body files designed for optimal matching & accuracy enabling 35µ technology
- Reusable - designed for use with both desktop & intraoral scanners
- Available in two different heights for optimal clinical fit in the occlusion
- Retaining screw is included for efficiency - laser marked for platform & height.



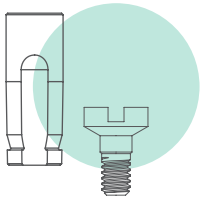
Digital Model Analog

The Digital Model Analog, designed for 3D printed models, integrates seamlessly with a comprehensive digital CAD-CAM solution. Whether derived from an intraoral scan or a desktop scan, this analog allows for the simultaneous creation of a digital model and CAD-CAM restoration planning.

Its optimized geometry for 3D printing, combined with a specialized lock screw, ensures precise positioning within the 3D model. This precision is pivotal for accurate restoration planning and simulation.

Adin's Digital Model Analog stands out for its user-friendliness. It facilitates prosthetic screw tightening in line with Adin's recommended torque levels. Furthermore, the clear color coding of the analog makes it easy to distinguish between different platforms.

In essence, the Digital Model Analog offers a versatile solution for every kind of restoration in the dental industry.



Ti Bases

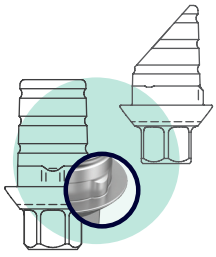
A Ti base is used to restore a dental implant using CAD-CAM solutions.

For this purpose, a superstructure is cemented onto the Ti base and can be used as the abutment or directly bolted screw,

Adin's Ti bases are available in different gingival & restorative heights to ensure maximum adaptation for the case needs.

Features:

- Wide variations of gingival and restorative heights, to fit any clinical situation
- Engaging (anti-rotation connection for single-unit restoration)
- Non-engaging variations (connection that allows rotation for multi-unit restorations)
- Angular engaged Ti Base (for anterior tooth restoration)
- For Touareg, Touareg-S, and Touareg UniFit implant connections systems
- Supports screw-retained and cement-retained restorations
- Retaining screw is included



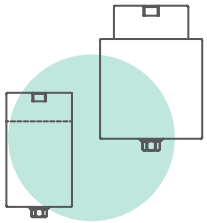
Titanium Blanks (Ti Blanks)

Pre-milled Adin Ti Blanks are used as a raw material for CAM fabrication of a single part (monolithic) titanium abutment. The production design of the individual abutment is done digitally with CAD software.

Adin Ti Blanks abutments are intended for use with dental implants as a support for single or multiple tooth restoration in the maxilla or mandible of a partially or fully edentulous patient.

Features:

- Titanium Blanks, to be used for custom abutments, are available for Adin Implant Systems:
- Touareg™, Touareg-S™, and Touareg CloseFit™.
- Different sizes of Ø=11.5mm and Ø=15.8mm to accommodate all clinical needs
- Adin's Ti Blanks are Medentika PreFace® standard compatible
- As a customized abutment, the final milled part needs no additional manual manipulation
- Material: Titanium (Ti 6Al 4V ELI)



Digital Workflow Handling Procedure

The digital workflow requires the use of the following equipment and materials following the standard procedure according to the instructions of the system provider:

Equipment/Material	Requirements
Intraoral scanner	iTero Intra Oral Scanner by Align Technology S/N: WOA2021W24A026 Software: iTero Element Flex Ver. 1.13.15.70
Desktop scanner	Identica 3D Scanner by Medit Corp S/N: 1M17051DA191 Software: Medit Corp ColLab Scan Ver. 2.0.0.4(R.20415)
Design (CAD) software	AbutmentCAD by EXOCAD GmbH Ver.3.1. Cleared under K193352
CAM Software	WORKNC Dental by Hexagon AB
CAM Milling Unit	Ceramill Motion 2 by Amann Girrbach Motion Ver. DNA
CAM Milling Tools	DC1 Milling System by Dental Concept System GmbH Model DC1
Zirconia Raw material	Zirconia Argen Z Ultra Cleared under K071410
Dental Cement	Panavia V5 cement Cleared under K150704

When using the digital workflow, the standard procedure according to the system provider instructions applies.

The instructions for use of the material manufacturer shall be followed. For setup, validation, use, tools, maintenance, and lifetime information on scanners, ovens, and milling machines, please refer to the manufacturer's instructions/ user manual.

Warning: Do not use any dental cements, restorative material, scanners, milling units, and CAM software, other than those specifically identified for Adin Ti bases and Ti blanks.

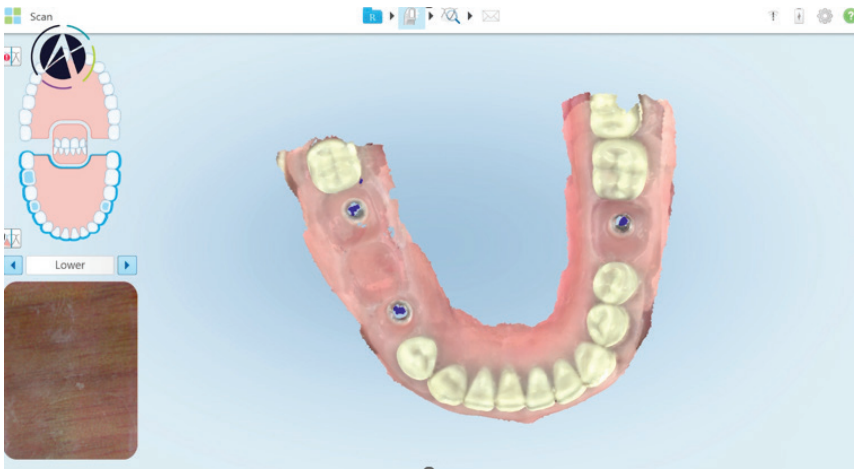
Scanning Procedure

Using digital workflow (intra-oral scanning)

1. For detection of the precise implant position during scanning, using Adin's Scan bodies.

Implant System	Platform Connection	Compatible Scan Bodies
Touareg™ Touareg-S™	RS(Regular Standard Internal Hex)	RS0088 - RS Scan Body 7mm RS0089 - RS Scan Body 10mm
Touareg CloseFit™ UNP (Ultra Narrow Platform) 2.75mm	UNP (Conical Hex Connection)	UNP0088 - UNP CloseFit™ Scan Body 7mm UNP0089 - UNP CloseFit™ Scan Body 10mm
Touareg CloseFit™ NP (Narrow Platform) 3.0mm	NP (Conical Hex Connection)	NP0088 - NP CloseFit™ Scan Body 7mm NP0089 - NP CloseFit™ Scan Body 10mm
Touareg CloseFit™ RP (Regular Platform) 3.5mm	RP (Conical Hex Connection)	RP0088 - RP CloseFit™ Scan Body 7mm RP0089 -RP CloseFit™ Scan Body 10mm
Touareg CloseFit™ WP (Wide Platform) 4.3 / 5.0mm	WP (Conical Hex Connection)	WP0088 - WP CloseFit™ Scan Body 7mm WP0089 - WP CloseFit™ Scan Body 10mm
Touareg UniFit (3.5mm, 3.75mm, 4.3mm, 5.0mm, 6.0mm)	UF (Conical Star connection)	UF0088 - UniFit Scan Body 7mm UF0089 - UniFit Scan Body 10mm

2. For a correct digitization, scan the patient's teeth by using an intra oral scanner.
3. For details of the use of the intra oral scanner, see the intra oral scanner manual.



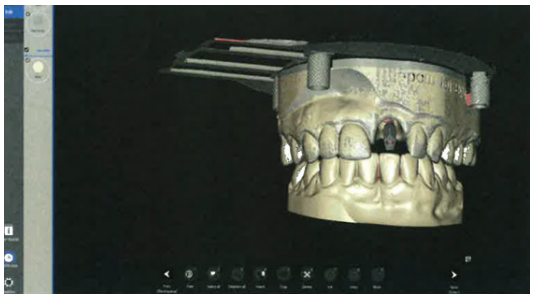
Model Creator

4. If an intro oral scanner was not used, obtain an impression of the patient's teeth using the standard impression technique.
5. Using the design software, create a digital working model.
6. Export the STL file and send it to 3D print provider.
7. Place Adin Implant Digital Analog on the working model as follows:

Implant System	Platform Connection	Compatible Scan Bodies
Touareg™ Touareg-S™	RS(Regular Standard Internal Hex)	RS1000 - RS Digital Model Analog
Touareg CloseFit™ UNP (Ultra Narrow Platform) 2.75mm	UNP (Conical Hex Connection)	UNP1000 - UNP Digital Model Analog
Touareg CloseFit™ NP (Narrow Platform) 3.0mm	NP (Conical Hex Connection)	NP1000 - NP Digital Model Analog
Touareg CloseFit™ RP (Regular Platform) 3.5mm	RP (Conical Hex Connection)	RP1000 - RP Digital Model Analog
Touareg CloseFit™ WP (Wide Platform) 4.3 / 5.0mm	WP (Conical Hex Connection)	WP1000 - WP Digital Model Analog
Touareg UniFit (3.5mm, 3.75mm, 4.3mm, 5.0mm, 6.0mm)	UF (Conical Star connection)	UF1000 - UF Digital Model Analog

Using Digital Workflow (desktop scanning)

1. After obtaining a conventional impression of the patient's teeth setup or a scanned model, create a working model with the digital analogs (see compatibility table above).
2. Place Adin Scan body in the Analog to identify the position and orientation of the dental implant.
3. Scan the working model using the desktop scanner.
4. For details of the use of the desktop scanner, see the desktop scanner manual.


Designing the zirconia superstructure

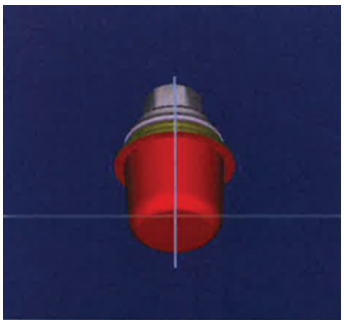
The zirconia superstructure must be designed using AbutmentCAD design software with the relevant Adin library files installed.

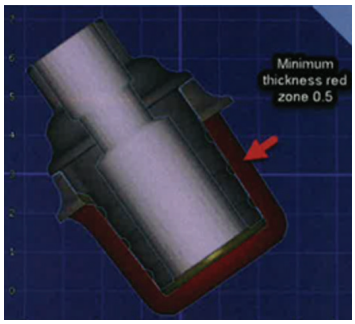
The Adin library files can be obtained via the EXOCAD server in the software (download center).

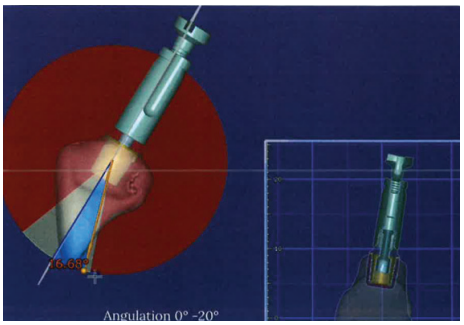
For details of the design process for AbutmentCAD, see the AbutmentCAD User Manual.

Adin library file has built-in design limitations, and the user is not allowed to exceed the limitations – Refer to Ti-Base Zirconia Superstructure Design Limits below:

- Minimum wall thickness – 0.5 mm
- Minimum post height for single-unit restoration – 4.0 mm
- Minimum gingival height – 0.0 mm
- Maximum gingival height – 4.5 mm
- Maximum angulation - 20°







Manufacturing the zirconia superstructure

1. Import the digital file from the scanner into the design software.
2. Import library file and select relevant implant platform from the library.
3. Design the zirconia superstructure using AbutmentCAD design software with Adin libraries installed – libraries can be downloaded from: https://www.adin-implants.com/cad-cam
4. Send the zirconia superstructure file to the milling machine, using the preset settings and fabricating the part with dental zirconia CAM Milling Tools according to the manufacturer's instructions/user manual.
5. The zirconia superstructure must be created from ArgenZ Ultra and sintered according to manufacturer's instruction.
6. For details of the use of the CAM software and milling machine, including information on milling machine set-up and on-site validation, maintenance/use-life guidelines for milling machine and tools, and identification of tools for use with zirconia, see the milling machine manufacturer's User Manual.
7. The zirconia superstructure shall be cemented to the abutment using the cement recommended in the labelling (Panavia V5).

Processing the Ti Base in the Laboratory

Modification of the Ti Base is not permitted unless clearly indicated in the manual. The contact surfaces of the Ti Base to the implant should not be sandblasted or otherwise processed. Only the surfaces of the Ti Base intended for cementing with a superstructure may be sandblasted (50µm aluminum oxide, max. 2.0 bar) and then cleaned (with alcohol or steam).

Use "PANAVIA™ V5" or equivalent as an adhesive extra orally to connect the Ti Base and the sintered Zirconia superstructure. Other glues are required for attaching different materials. Observe the operating instructions for the material used.

1. For easier handling during the gluing process, it is recommended that the Ti Base be screwed into an implant analog or a polishing tool.
2. Cover the hex head of the abutment screw with wax.
3. Sand-blast the gluing surfaces of the Ti Base with 50 µm aluminum oxide and up to 2.0 bar and clean the surfaces with alcohol or steam.
4. Ensure that the superstructure can be fully engaged into the Ti Base.

Processing the Ti Base for Screw Retained Cases

1. Apply metal primer and glue to the Ti Base while observing the manufacturer specifications.
2. Push the sintered Zirconia (or any other equivalent material) superstructure in as far as it will go. Make sure it latches into the rotation and position stops.
3. Remove excess glue immediately. Make sure that there is no glue residue left in the screw channel.
4. Follow the recommendations of the glue manufacturer with regard to the final hardening of the glue.
5. Remove residue with a rubber polisher after hardening.

Processing the Ti Base in the Dental Clinic by the Dentist for Cement Retained Cases

1. The Ti Bases and a compatible retaining screw are delivered in non-sterile condition.
2. Clean and sterilize according to instructions provided in Cleaning and Sterilization section below.
3. Connect the Ti Bases to the Implant and tighten the Retaining Screw according to the table below.
4. Apply metal primer and glue to the Ti Base while observing the manufacturer specifications.
5. Push the superstructure; sintered Zirconia (or any other equivalent dental material) crown in as far as it will go. Make sure it latches into the rotation and position stops. Remove excess glue immediately. Make sure that there is no glue residue left in the Ti Base chamfer.
6. Follow the recommendations of the glue manufacturer with regard to the final hardening of the glue.
7. Remove residue with a rubber polisher after hardening.

Pre-milled Blank abutment Processing

Designing Ti Blank

The Abutment Blank may at its outer form be individually adapted to the anatomical condition. The production of the individual Abutment is done digitally with CAD software.

Basic rules should be observed. The design of the emergence profile should be done carefully. Creating a greater widening of the gingiva than that formed by healing abutments should always be done after consultation with the restorative dentist. The gingiva can be formed by custom made temporary abutments or custom made healing abutment.

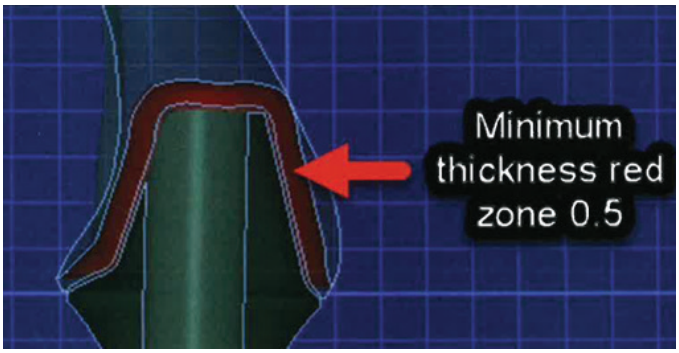
In general, the following applies: place the circumferential shoulder in the labial region slightly sub-gingivally and follow the gingival contour in the oral region. This allows the cement between the copings and abutment to be easily removed and the junction is not visible from the labial aspect.

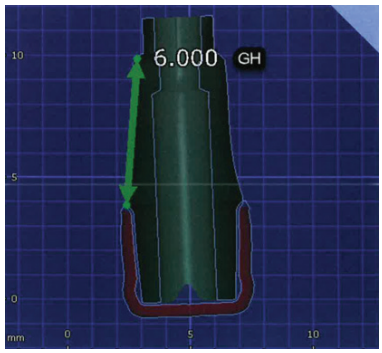
Manufacturing Pre-milled Blank abutment

1. Import the digital file from the scanner into the design software.
2. Import library file and select relevant implant platform from the library.
3. The Pre-milled custom abutment must be designed using AbutmentCAD system design software with Adin libraries installed – libraries can be downloaded from: https://www.adin-implants.com/cad-cam

Adin library file has built-in design limitations, and the user is not allowed to exceed the limitations – Refer to Ti-Blank Design Limits below:

- Minimum abutment wall thickness – 0.7 for RS; 0.5 mm for UNP, NP, RP, WP (screw hole to outer abutment surface)
- Minimum post height for single-unit restoration – 4.0 mm
- Milled abutment height, Maximum 10 mm (above implant level)
- Minimum gingival height – 0.5 mm
- Maximum gingival height – 4.0 mm for RS; 1.0 mm for UNP; 3.0 mm for NP, RP, WP.
- Maximum angulation – 25° for RS, NP, RP, WP; 15° for UNP.
- Abutment should be rounded occlusally
- Abutment sharp edges should be avoided





4. Send Pre-milled Blank abutment file CAM Milling Unit, using the preset settings and fabricating the part with a CAM Milling Tools according to the manufacturer's instructions/user manual.
5. For details of the use of the CAM software and milling machine, including information on milling machine set-up and on-site validation, maintenance/use-life guidelines for milling machine and tools, and identification of tools for use with zirconia, see the milling machine manufacturer's User Manual.

Milling Center Processing

Abutment Blanks are processed in a milling center using milling machines abutment holders.
The abutment holder is used for gripping the Abutment Blank in the correct position in the milling machine in order to process it as required. Abutment Blanks are gripped face-side first in their abutment holders ensuring that they are fully seated. After milling stage is complete, the end user is to visually inspect the implant-abutment connection of the abutment blanks for any damage which may have been caused during the milling machine processing.

Further processing

If further steps are required following processing of the abutment in the CAD/CAM milling machine, please notice the following:
The minimum wall thickness of 0.5 mm may not be reduced. Ridges and edges must be avoided.

We recommend that you affix the Abutment Blank in laboratory analogs to safeguard the connection geometry.
Damage to the connection geometry of the implant may compromise abutment performance.

Veneering

If a milled Abutment is to be veneered directly, the veneering is produced using veneering materials suitable for titanium and in accordance with the relevant manufacturer's instructions/user manual.

Cleaning

Before placing the restoration in the patient's mouth, proceed with the following cleaning procedure:

Manual cleaning using ultrasonic cleaner:

- Disassemble the devices (if applicable)
- Rinse the devices under running cold water and while keeping them immersed, brush thoroughly away from the body
- Place the devices in an ultrasonic cleaner with a neutral or mild pH enzymatic detergent (e.g. deconex® POWER ZYME) diluted with purified water as 1ml/liter or as per the manufacturer's instructions.
- Sonicate the devices for 10 minutes
- Rinse the devices with tap water for a minimum of two minutes and brush with a soft bristled brush
- Clean the interior lumen of the device (where applicable) with a thin wire to remove any remaining debris
- Inspect the devices visually for any remaining contamination or debris and scrub as necessary

Automated cleaning using automated washer:

- Disassemble the devices (if applicable)
- Place the instruments in an automatic washer with neutral or mild pH enzymatic detergent (e.g. deconex® POWER ZYME) diluted per the manufacturer's instructions.
- Perform the washing cycle, with the following cycle parameters:
  - 4 minutes pre rinse with cold water at 30 ± 5°C
  - 10 minutes cleaning with enzymatic detergent at 55 ± 5°C
  - 1 minute intermediate rinse at 30 ± 5°C
  - 10 minutes final rinse at 30 ± 5°C with distilled water
  - 35 minutes drying at 80±5°C
- Inspect the devices visually for any remaining contamination or debris and scrub as necessary.

Note: Visual inspection for cleanliness should be performed with magnifying glasses. If necessary, perform recleaning again until the devices are visibly clean.

Drying

Dry the devices using paper toweling or dry heat not exceeding 132°C/270°F.

Sterilization

Before placing the restoration in the patient's mouth, clean and sterilize. Place the devices in FDA-cleared wrap, pouch, or other method of maintaining sterility for these intended autoclave sterilization cycles. Autoclave Sterilization Parameters are listed below:

Cycle Type	Temp.	Exposure Time	Drying Time
Gravity Displacement	132°C / 270°F	15 minutes	30 minutes
Pre-Vacuum	132°C / 270°F	4 minutes	30 minutes

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