

Instructions for Use for Medartis APTUS Systems

I. General Instructions

These instructions for use do not include all of the information necessary for use of the products. Additional information on the products (e.g. surgical techniques, instructions for handling of sterile products, instructions for reprocessing and maintenance, assembly/disassembly instructions) can be found on the internet at ifu.medartis.com. They can also be requested from your local Medartis representative or the Medartis distribution partner. All instructions provided in this document and in the corresponding user information must be followed.

The individual parts of the system may only be accepted when the manufacturer's label and packaging are undamaged and unopened at the time of delivery. Moreover, they may only be accepted when no (foreign) particles are visible at the time of delivery. If this is not the case, the rejected goods must be returned to Medartis AG, Basel/Switzerland, or to the relevant Medartis representative or distribution partner within ten working days.

II. Scope

Implants and instruments for the following APTUS systems are covered by these instructions for use:

- APTUS Hand
- APTUS Wrist
- APTUS Forearm
- APTUS Elbow
- APTUS Shoulder
- APTUS Foot
- APTUS Ankle
- APTUS CCS

The complete list of items can be found in the corresponding surgical technique(s) under ifu.medartis.com.

III. Product Description

Product Materials

Medartis implants and instruments are manufactured from biocompatible materials. All materials are standard implant and instrument materials for use in medical devices for orthopedics, traumatology and general surgery.

Product	Material
Plates, Washers	cpTi (ASTM F67), Ti6Al4V (ASTM F136)
Screws, Wedges, Inserts	Ti6Al4V (ASTM F136)
Spiral blades	cpTi (ASTM F67)
Staples	Stainless steel (ASTM F139)
K-wires	Stainless steel (ISO 5832-1)
Instruments	Stainless steel, aluminum, aluminum alloy, cpTi (ASTM F67), Nitinol, PA, PEEK, POM, PP, PPSU, PTFE, silicone
Containers	Stainless steel, aluminum alloy, PEEK, PP, PPSU, silicone

Color Coding Concept

APTUS systems encompass two color coding concepts to distinguish the two locking technologies "TriLock" and "PentaLock":

Color coding TriLock

System Size	Color Code
1.2	Red
1.5	Green
1.7	Turquoise
2.0	Blue
2.2	Purple
2.3	Brown
2.5	Purple
2.8	Orange
3.0	Yellow
3.5	Green
4.0	Brown
5.0	Dark Blue
7.0	Turquoise



Implant colors TriLock

Implant plates gold	Fixation plates (fixation)
Implant plates blue	TriLock plates (locking)
Implant screws gold	Cortical screws (fixation) and CCS
Implant screws blue	TriLock screws (locking) and screws for spiral blade fixation
Implant screws pink	Cancellous screws (fixation)
Implant screws silver	TriLock Express screws (locking) and transfixation screws
Implant screws green	SpeedTip screws (self-drilling)

Color coding PentaLock

System Size	Color Code
3.5 / HD15	Dark Blue

Implant colors PentaLock

Implant plates turquoise	PentaLock plates	
Implant spiral blades gold	Spiral blades	
Implant screws for blade fixation gold	Screws for blade fixation	
Implant screws dark blue	PentaLock screws	
Implant screws dark blue with ring marking on the screw head	Cortical screws	

Intended Purpose

The APTUS fixation systems are intended for temporary fixation, correction or stabilization of bones.

Indications and Contraindications

Indications and contraindications for each APTUS System can be found in the corresponding surgical technique under ifu.medartis.com.

Intended User / Patient Target Group

The products may only be used by health care professionals, e.g. surgeons, radiologists, operating room staff, and individuals involved in the preparation of the device, who hold the relevant qualifications.

Medartis, as the manufacturer, recommends that the user reads all available documents (e.g. surgical techniques, instructions for handling of sterile products, instructions for re-processing and maintenance, assembly/disassembly instructions) before first use and contacts other users who have practical experience with this type of treatment. The user must be familiar with the state of the art and the instrument and implant function. Patient target groups are defined by the indications and contraindications of the system being used as defined in their specific surgical techniques. Responsibility for proper selection of patients rests with the surgeon, based on the specific indications and contraindication of each system and on patient-related factors (e.g. activity, occupation, mental health, age, bone quality).

Intended Performance

The available clinical data confirms good clinical performance and safety outcomes in a wide range of indications of the APTUS systems, when they are used according to the user information. This is in line with or superior to the state of the art.

IV. Side Effects / Possible Complications

In most cases, potential complications have a clinical or patient-related source as opposed to arising from the implants/instruments. These include among other things:

- Loosening of the implant from insufficient fixation
- Hypersensitivity to metal or allergic reactions
- Bone necrosis, osteoporosis, insufficient revascularization, bone resorption and poor bone formation that can cause premature loss of fixation or implant breakage
- Soft tissue irritation and/or nerve damage through surgical trauma
- Early or late infection, both superficial and deep
- Elevated fibrotic tissue reaction around the surgical area
- Complications in implant removal from improper explantation of the implant (e.g. due to bony ingrowth)

The manufacturer is not responsible for any complications arising from incorrect diagnosis, choice of incorrect implant, or incorrectly combined implant components.

V. Warnings

- The products may only be used by medical personnel who hold relevant qualifications.
- Medartis, as manufacturer, recommends that the user reads all available documents before first use and contacts other users who have practical experience with this type of treatment.
- All of the implant components are intended for single use and may not be reused under any circumstances. Unless otherwise expressly stated on the label, the instruments can be reused.
- Necessary care must be observed for storage and use of the products:
 - Damages (e.g. from improper cutting or bending) to and/or scratches on the instruments/implants can substantially impair the strength of the product and lead to premature breakage.
 - Repeatedly bending the plate in opposite directions may cause the plate to break during postoperative treatment.
- Twist drills and reamers: It is recommended not to exceed a maximum drilling speed of 1'000 revolutions per minute to avoid overheating the bone. The drill guide and bone should be cooled while drilling. With reamers, it is advisable to use a speed of less than 1'000 revolutions per minute, or to use a handle for controlled, manual reaming. Reusable, non-sterile packaged twist drills and reamers may only be used a maximum of ten times. Sterile packaged twist drills and reamers are for single use only and may not be reused under any circumstances.
- Never use products that have been damaged by transport, improper handling in the hospital, or in any other way!
- The sterilizing cases, instrument trays and implant containers shall not be vigorously shaken or tipped over since the individual components and content may become damaged or fall out.

For application-specific warnings related to APTUS systems, it is mandatory to consult the surgical technique (ifu.medartis.com) of the corresponding product system being used.

VI. Cautions

- All of the system components have been developed and manufactured for a specific purpose and are therefore precisely adapted to each other. The user may not alter any of the components or replace them with an instrument or product from another manufacturer even if the size or shape is similar or exactly corresponds to that of the original product. The use of materials from other manufacturers, structural changes resulting from the use of third-party products and/or material impurities, as well as minor deviations or imprecise fit between the implants and instruments, or similar, can represent a risk for the user, patient or third parties.
- Use the indicated screwdriver for the respective system size. Make sure that the screwdriver/screw head connection is precisely aligned in axial direction. If not, there is a greater risk of damage to the implant and screwdriver blade. When inserting the screw, ensure that a sufficient axial force is used between blade and screw. At the same time, the axial force should be in certain limits in order not to damage the bone structure.

For application-specific cautions related to APTUS systems, it is mandatory to consult the surgical technique (fu.medartis.com) of the corresponding product system being used.

VII. General Important Information

Clinical Benefits

In consideration of patient's clinical condition and medical history, the treating physician shall ensure that the use of APTUS systems can be justified based on a patient-specific benefit/risk assessment. Based on the clinical evaluation and risk analysis, all residual risks are deemed acceptable when weighed against the benefits to the patient based on current knowledge/the state of the art.

Selecting the Appropriate Implants

Medartis, as the manufacturer, does not recommend a specific surgical procedure for a specific patient. The operating surgeon is solely responsible for choosing the appropriate implant for the specific case. The follow-up treatment as well as the decision of whether to retain or explant the implant is the responsibility of the user.

The treating physician must beforehand become thoroughly familiarized with the procedure, for example by:

- Carefully studying all the product documentation
- Carefully reviewing the current professional literature
- Consulting with colleagues experienced in this field and with the use of this system
- Practice in handling the system, practice of the surgical procedure and postoperative treatment

Generally, implants are designed to remain in the body temporarily and be removed after sufficient (osseous) healing has taken place. They are not designed for long-term bone replacement. Where they are mechanically supporting the osteosynthesis, the regular operating period of the implants is expected to be between 30 days and 6 months.

Removal of Implants

In the case of complications, it might be necessary to remove the implants. For removal use the indicated screwdriver. Make sure that the screwdriver/screw head connection is precisely aligned in an axial direction.

Postoperative Care

Taking into account the individual fracture conditions and patient compliance, it is important to ensure adequate postoperative relief of the osteosynthesis in terms of adaptation or mobilization stability (e.g. splinting and/or immobilization). Postoperatively, the fixation achieved with the implants must be treated with care until the bone has fully healed. Patients must strictly observe follow-up instructions given by their physicians to avoid detrimental strain on the implants. Early load-bearing can increase the risk of loosening, migration or breakage of the implants.

MRI Safety Information



MR Conditional

Non-clinical testing has demonstrated that all current Medartis implants are MR Conditional in accordance with the ASTM F2503-23 standard definition. Patients can be safely scanned in a MR system meeting the conditions below. Failure to follow these may result in injury to the patient.

Parameter	Conditions of Use/Information
Static Magnetic Field Strength	1.5 T, 3.0 T
Type of Nuclei	Hydrogen
Static Magnetic Field (B ₀) Orientation	Horizontal
Magnet Type	Cylindrical-bore
Maximum Spatial Field Gradient	1.5 T 20 T/m (2000 G/cm) 3.0 T 17 T/m (1700 G/cm)
RF Excitation	Circularly polarized (CP)
RF Transmit Coil Type	Integrated whole body transmit coil
RF Receive Coil Type	Any receive only coil may be used.
MR System (RF) Operating Modes or Constraints	Normal operating mode (including FPO:B)
Maximum Whole-Body SAR	Whole-body SAR ≤ 2 W/kg and head SAR ≤ 3.2 W/kg Note During non-clinical testing, the Medartis implants produced a maximal temperature rise of 14.7 ± 1.0°C at 1.5 T for a measured WB-SAR of 2.1 ± 0.8 W/kg and a maximal temperature rise of 5.5 ± 1.0°C at 3 T for a measured WB-SAR of 2.1 ± 0.9 W/kg both after 15 minutes of continuous scanning.

	Under the scan conditions defined above, the Medartis implants are expected to produce a maximum temperature rise ≤ 6.5°C at 3 T after 15 minutes, and ≤ 4°C after 7 minutes of continuous scanning.
Scan Duration and Wait Time	Scan for up to 30 minutes of continuous RF exposure with one or more MR imaging pulse sequences (scans or series) followed by a wait time of 30 minutes before resuming scanning.
Instructions to be followed before, during and/or after the MRI exam	During the MRI scan, it is recommended to visually and audibly monitor the patient, including verbal communication and to maintain controlled conditions (a medical doctor or a dedicated trained person can respond instantly to heat induced physiological stress). Do not scan patients with impaired thermoregulation, temperature or pain sensation.
Device Configuration	Scans excluded for patients with either of the following implants: - Percutaneous implant placement (e.g. K-wires) - Multiple implants in close proximity (distance < 2 mm); this includes broken implants. It is possible to scan implant constructs in direct contact (e.g. plate-screw-constructs)
MR Image Artifact	MR image quality may be compromised if the imaging area of interest is in the exact same area of the implant. Some manipulation of scan parameters may be required to compensate for the artifact. In non-clinical testing, the MR image artifact caused by the item extends approximately 29 mm from the device when imaged with a gradient echo pulse sequence at 1.5 T.

Note the following:

- Reduce the SAR as much as possible, as reducing the SAR strongly reduces the temperature increase caused by RF heating.
- Use an external cooling/ventilation system to help reduce the body temperature.

VIII. Cleaning, Disinfection and Sterilization of Non-Sterile Products

All implants and instruments in the APTUS systems that are delivered **NON-STERILE** must be cleaned, disinfected and sterilized before each use. This also applies to the first use after delivery. All packaging must be removed before preparation.

Thorough cleaning and disinfection are essential for effective sterilization.

All implant components are intended for one single application in a single patient. Implants that were used in a patient and removed, have to be discarded following the local requirements. Application of an already used device may compromise the structural integrity of the implants and/or lead to device failure which may result in patient injury. Furthermore, the application of an implant that has already been used may create a risk of contamination e.g. due to the transmission of infectious material from one patient to another. This could result in injury to the patient or user.

Implants that have not come into direct contact with a patient may be reprocessed. Implants that have come into direct contact with blood or other bodily fluids or show visual contamination must be cleaned and disinfected separately before they can be placed back into the implant case/tray.

It is the user's responsibility to ensure that the implants are completely sterile when used, to use device- and product-specific procedures for cleaning/disinfection and sterilization that are sufficiently validated, to regularly service and inspect the employed devices (disinfectant, sterilizer), and to ensure that the validated and/or manufacturer's recommended parameters are maintained for each cycle.

The statutory regulations applicable in your country and the hospital's hygiene requirements must also be observed. This applies in particular to the various instructions for effectively deactivating prions.

Detailed instructions for processing/reprocessing of medical devices are described in the brochure "Instructions for Cleaning, Disinfection, Sterilization, Inspection and Maintenance of Medartis Products" and can be downloaded from fu.medartis.com.

IX. Complaints and Adverse Events

Any complaint or adverse event that has occurred in relation to the device should be reported to the manufacturer and the respective national competent authority of the state in which the user and/or patient is established.

X. Disposal

Any contaminated implant (by blood, tissue or other human fluids) may not be reused and must be handled according to hospital instructions. The product must be disposed of as a medical device according to hospital procedures.

XI. References



















The following user documentation on the products is additionally available online and can be found under the following link fu.medartis.com:






- Surgical techniques
- Instructions for handling of sterile plates, screws, staples and instruments
- Instructions for cleaning, disinfection, sterilization, inspection and maintenance
- Assembly/disassembly instructions

For additional information contact your local Medartis representative the Medartis distribution partner or the manufacturer directly under the given address.

XII. Symbols

	Consult instructions for use
	Article number / Reference number
	Lot number / Batch code

	Serial number
	Non-sterile
	Single-use product. Do not reuse
	The product is intended for one single application in a single patient. Application of an already used product may compromise the structural integrity of the device and/or lead to device failure, which may result in patient injury.
	Do not re-sterilize
	Resterilization can result in implants not being sterile, and/or not meeting performance specifications and/or altered material properties. Resterilization may also compromise their structural integrity and/or lead to failure.
	<p>Sterile product. Sterilized using irradiation</p> <p>The product has been subjected to a validated irradiation sterilization process and is supplied in sterile packaging. Prior to use, check the product expiration date and verify the integrity of the sterile packaging. Do not use any product where the sterile packaging has been opened or damaged and do not remove them from the packaging until immediately before use. Once the sterile packaging has been opened, the product cannot be re-sterilized. Sterility of the device must be ensured at all times. The device is for single-use only and may not be reused under any circumstances. Reuse or reprocessing (e.g. cleaning and re-sterilization) may compromise the structural integrity of the device and/or lead to device failure, which may result in patient injury.</p>
	Single sterile barrier system with protective packaging inside
	Do not use if packaging is damaged
	Medical device
 YYYY-MM-DD	Use by date
 YYYY-MM-DD	Manufacturer Date of manufacture
 YYYY-MM-DD	Date of manufacture
	MR conditional
	Authorized representative in the European Community / European Union
	Importer
	TriLock (locking technology)
	PentaLock (locking technology)

	HexaDrive
	Applies only to EC risk class I devices in sterile condition, class I devices with a measuring function, class I reusable surgical instruments and class IIa and IIb devices.
	Applies only to EC risk class I devices.
	Applies only to UK risk class I devices in sterile condition, class I devices with a measuring function, class IIa and IIb devices.
	Applies only to UK risk class I devices.

This document is subject to continuous revision. The most current version is always available online at fu.medartis.com.



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Disclaimer: This information is intended to demonstrate the Medartis portfolio of medical devices. A surgeon must always rely on her or his own professional clinical judgement when deciding whether to use a particular product when treating a particular patient. Medartis is not giving any medical advice.

The devices may not be available in all countries due to registration and/or medical practices. For further questions, please contact your Medartis representative (www.medartis.com). This information contains products with CE and/or UKCA marking. All pictures shown are for illustration purposes only and may not be an exact representation of the product.

For US only: Federal law restricts this device to sale by or on the order of a physician.

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