

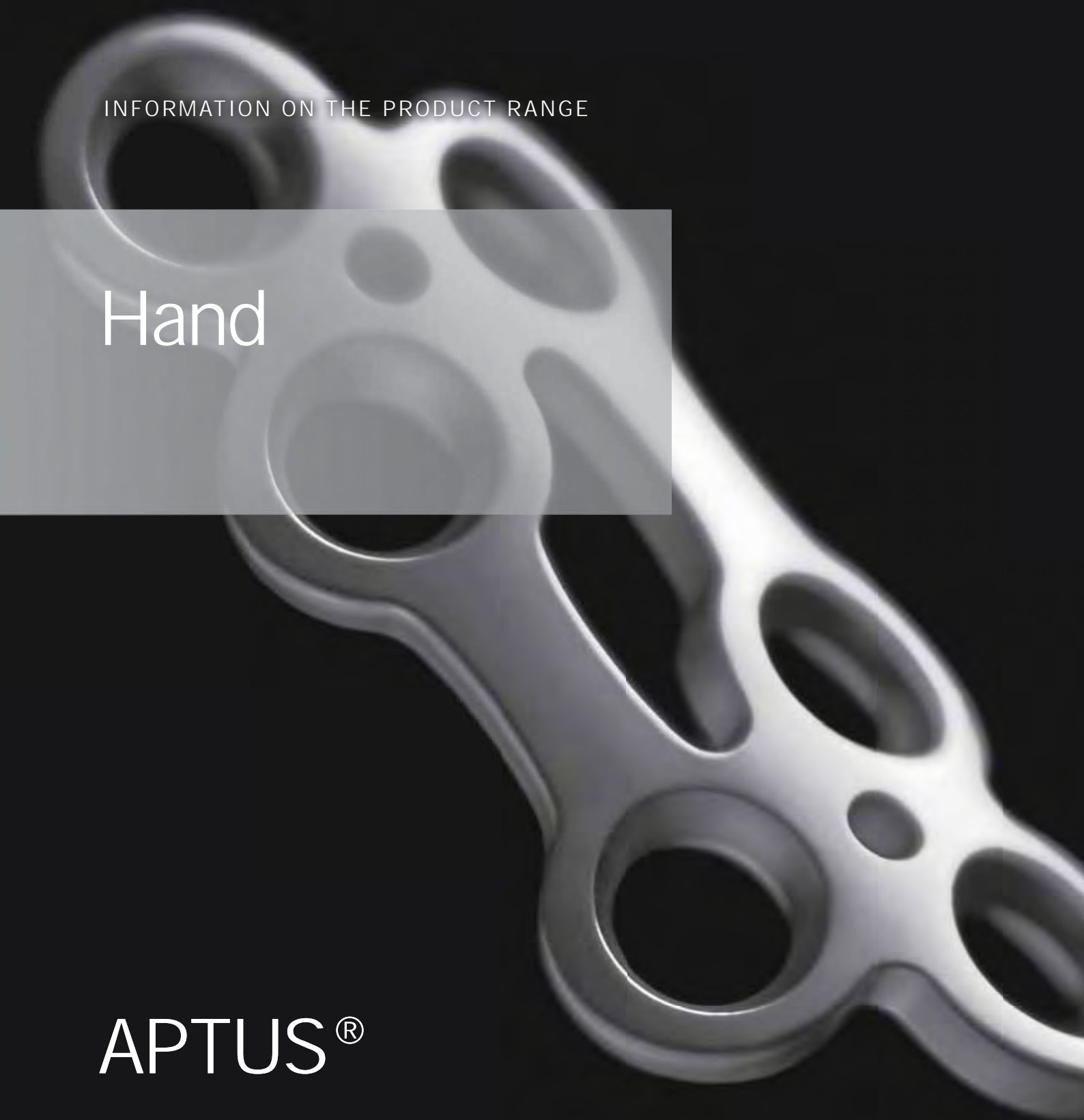
medartis®

PRECISION IN FIXATION

INFORMATION ON THE PRODUCT RANGE

Hand

APTUS®





# APTUS<sup>®</sup> Hand

## INTRODUCTION

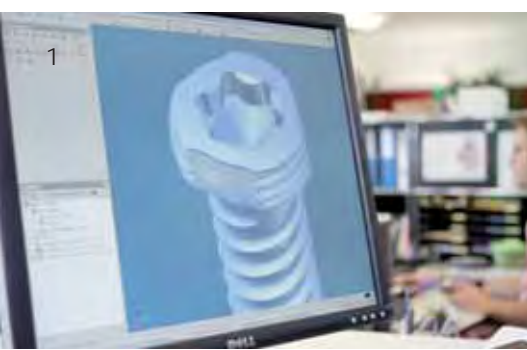
Injuries and skeletal diseases represent a challenge to modern hand surgery. The anatomically complex bone and joint structures, as well as soft tissue in confined spaces, require a high degree of skill and precision to reconstruct and restore function. In this regard, new biomechanically improved implants, in combination with appropriately matched instruments, facilitate daily work and contribute to reliable rehabilitation and preservation of function.

In collaboration with leading specialists, Medartis has developed the unique APTUS Hand fixation system for fracture treatment and reconstructive surgery. The different plate designs are adapted to the anatomy of the hand skeleton. A reduced profile height and an optimized implant surface minimize soft tissue irritation. With the development of the TriLock locking technology, complex and intra-articular fractures are stabilized by means of the internal fixator principle. The improved biomechanical characteristics of the implants permit early mobilization and active therapy.

With the introduction of APTUS Hand, Medartis has been able to offer a considerable contribution toward expanding the therapeutic diversity for treatment of fractures of the phalanges and metacarpals as well as of arthrodeses.

With TriLock, Medartis was the first company to offer a fully modular, multidirectional and angular stable hand fixation system – a trend that has become state-of-the-art in hand surgery.

# Precision in fixation



- 1 3D image of a TriLock screw
- 2 Medartis headquarters in Basel
- 3 Screw production
- 4 TriLock demo model, scale 10:1
- 5 Quality inspection

## Medartis AG, headquartered in Basel, Switzerland, specializes in technical high-precision implants for surgical fixation of bone fractures and osteotomies.

Medartis develops, manufactures and sells titanium screws and plates, surgical instruments and system solutions for fracture fixation. These implants allow for patient rehabilitation after surgical reconstruction of fractures, malunions and deformities or skeletal diseases and their adjacent soft tissues. Medartis is represented worldwide through its subsidiaries and a broad distributor network.

Our motto is "Precision in fixation." We place the highest priority on maintaining stringent quality standards, continuous further development and innovation as well as comprehensive service provision for surgeons, OR staff and patients. This enhances long-term customer relations based on partnerships and has formed the foundation for sustainable success since the company's founding in 1997. The goal of Medartis is to continually improve early functional rehabilitation through its high-quality products and exclusively developed technologies.

In order to fulfill the growing requirements of medical devices, our development teams engage in intensive knowledge exchange with our customers, partners and leading scientific institutes globally. Medartis' international locations allow us to determine the needs of surgeons and patients directly on site and to incorporate these needs into product development. This is the only way we can efficiently resolve current clinical problems and offer market-oriented products for use in the OR.

Service quality is considerably shaped by our international presence as well as local cooperation. Product quality is maintained by the fact that the entire process chain – from development to aftercare – is in the hands of our internal departments. Medartis can thus exclusively apply the newest technologies during product development for special areas such as small-bone surgery. At the same time, we have the greatest possible control over process quality and flexibility.

# 27 Bones – a Multitude of Options

## APTUS Hand

- For fractures of the distal, middle and proximal phalanges and of the metacarpals
- For arthrodeses of the phalanges and metacarpals
- For carpal fractures and arthrodeses



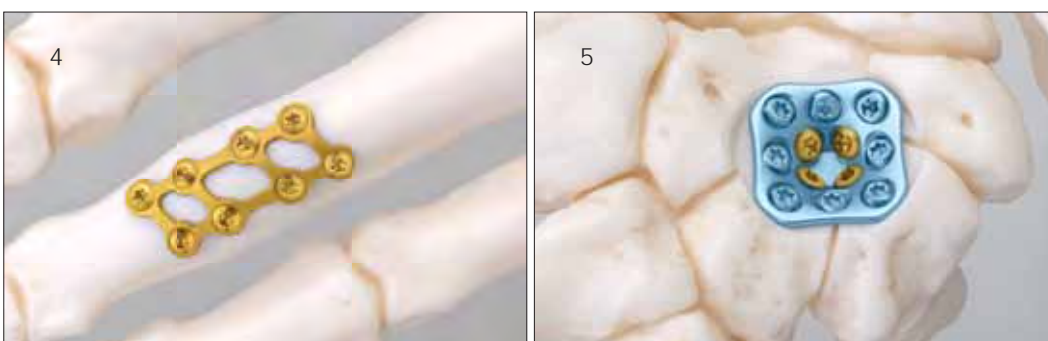
## APTUS HAND

### Trauma

Every fracture is different and must be treated accordingly. The primary objective is functional and pain free restoration of the anatomy and movement functionality of the hand. Medartis offers a large selection of plates and screws to find the best solution for all fracture types. Plate fixation and angular stable treatment solutions, according to the principle of internal fixation, permit early mobilization which may enhance the rehabilitative process.

### Arthrodeses

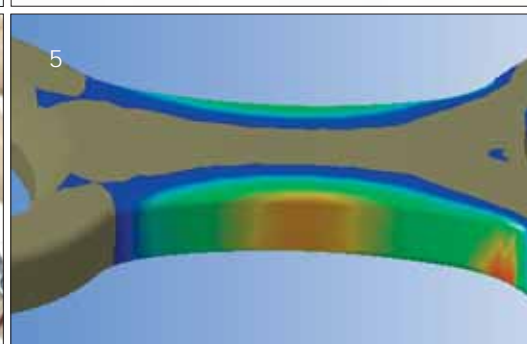
Arthrosis of the finger and thumb joints represent a frequent problem in medical practice. Pain free mobility of the finger joints is prerequisite for the functionality of the hand. If this can no longer be assured, arthrodesis is a potential method for treating painful finger joints.



- 1 Ligament/bone avulsion
- 2 Intra-articular fracture
- 3 Oblique fracture
- 4 PIP arthrodesis
- 5 Four Corner arthrodesis

# Anatomical Plate Design

## APTUS Hand



- 1 Fixation plates in the module
- 2 Detail of fixation plate
- 3 Four corner fusion plate with screws
- 4 Part of hand bone model
- 5 Finite elements presentation of a Medartis plate

For further information on the plate range, see the APTUS Ordering Catalog at [www.medartis.com/meta/downloads/marketing-materials](http://www.medartis.com/meta/downloads/marketing-materials).

- The system for perfect fracture management
- Multidirectional ( $\pm 15^\circ$ ) and angular stable fixation
- Fracture specific treatment and arthrodeses



#### PLATE RANGE

The plate range includes a broad choice of various plates for the following indications:

- Fractures of the distal, middle and proximal phalanges as well as of the metacarpals
- All transverse fractures, spiral fractures, fractures near joints with or without joint involvement, shaft fractures, comminuted fractures, dislocated fractures and ligament/ bone avulsions
- DIP, PIP and carpal arthrodeses

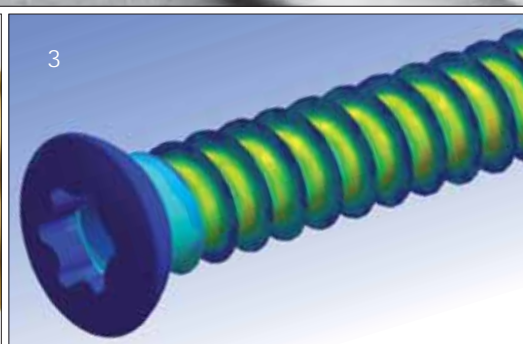
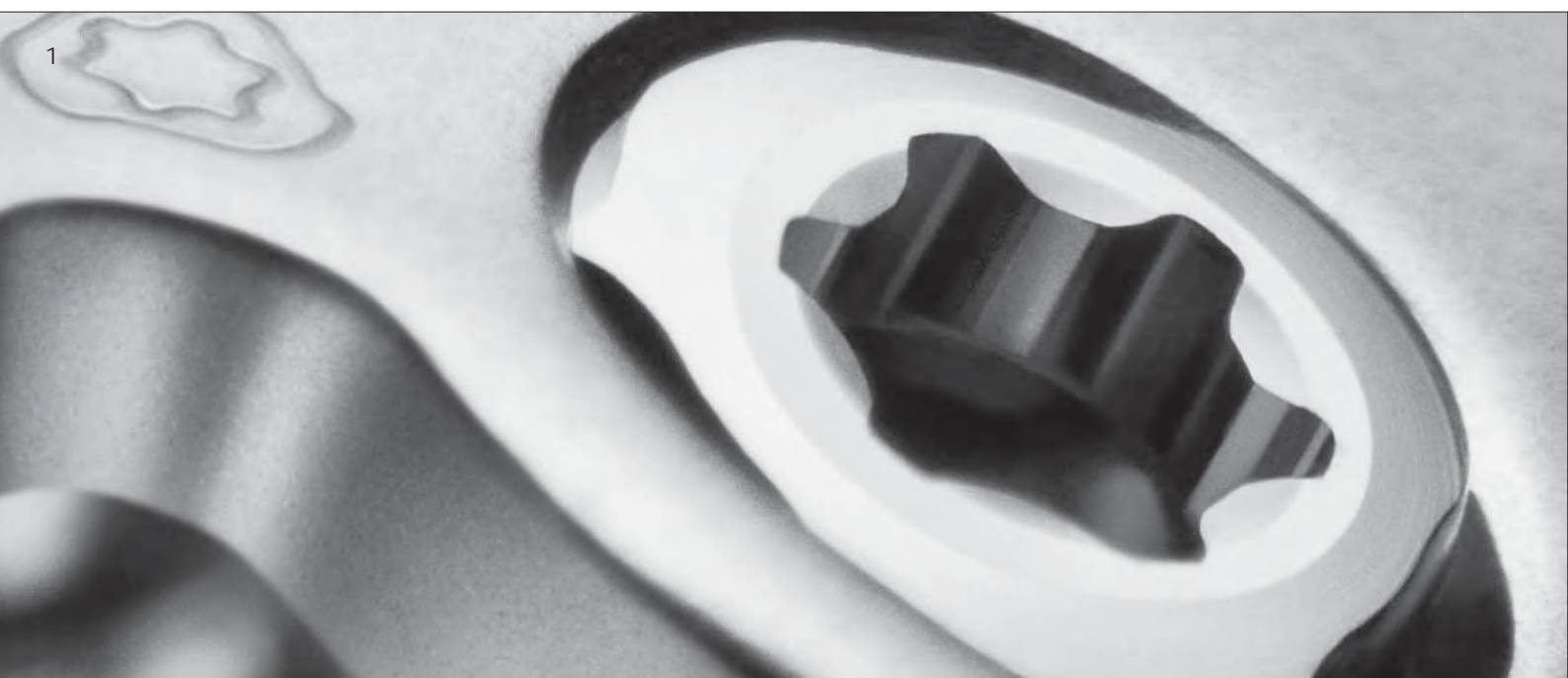
#### PLATE FEATURES

- Anatomically pre-contoured plate geometries for simple intraoperative application
- Well-rounded edges and highly polished surface for maximum soft tissue protection
- Color-coded implants for an easy identification in the OR:
  - o Gold = Fixation plates and cortical screws (fixation)
  - o Blue = TriLock plates and TriLock screws (locking)
- Offset screw holes in numerous plates provide increased rotational stability, avoid collisions between screws and prevent bone splitting
- 2 screw sizes can be used for each plate thickness:
  - o 1.2/1.5 screws for 0.6/0.8 mm plates
  - o 2.0/2.3 screws for 1.0/1.3 mm plates



# Superior Screw Technology

## APTUS Hand



- 1 TriLock – locked screw in plate
- 2 Sharp screw threads
- 3 Finite element analysis of torsional moments

For further information on the screw range, see the APTUS Ordering Catalog at [www.medartis.com/meta/downloads/marketing-materials](http://www.medartis.com/meta/downloads/marketing-materials).

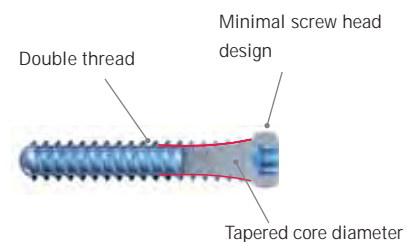
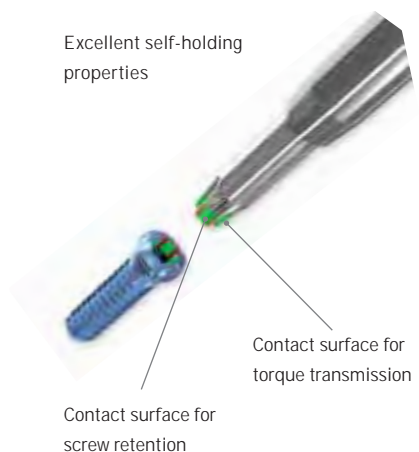
- HexaDrive interface with optimal self-holding properties
- Outstanding thread characteristics
- Excellent torsional and tensile strength

### SCREW OPTIONS

- 1.5 / 2.0 TriLock screws (locking)
- 1.2 / 1.5 / 2.0 / 2.3 cortical screws (fixation)

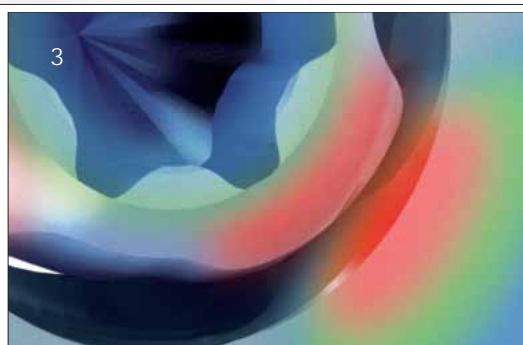
### SCREW FEATURES

- TriLock locking technology – secure, angular stable locking of the screw in the plate:
  - o Spherical three-point wedge-locking
  - o Friction locking through radial bracing of the screw head in the plate - without additional tensioning components
- HexaDrive screw head design for increased torque transmission and optimal self-retaining mechanism between the screw head and screwdriver blade
- Excellent self-tapping properties (without cutting flutes) and easy screw insertion due to precision cut thread profile
- Atraumatic screw tip minimizes soft tissue irritation when inserting screws bicortically
- Adapted pitches of the screw thread in cortical screws depending on screw length
- Double threaded TriLock screws for faster insertion
- Tapered core diameter close to the screw head for increased torsional and tensile strength



# Technology, Material and Biomechanics

## APTUS Hand



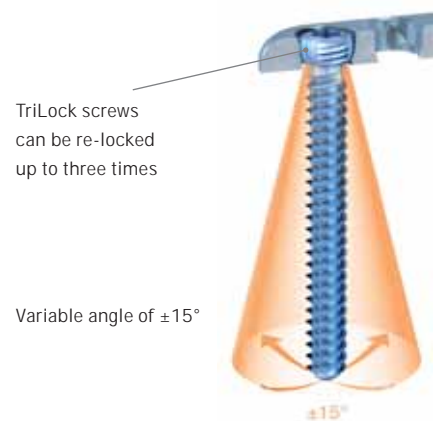
- 1 Plate hole with locking contour
- 2 Biomechanical test of an implant
- 3 Spherical three-point wedge-locking

- TriLock locking technology
- High-grade materials
- Highest quality standard

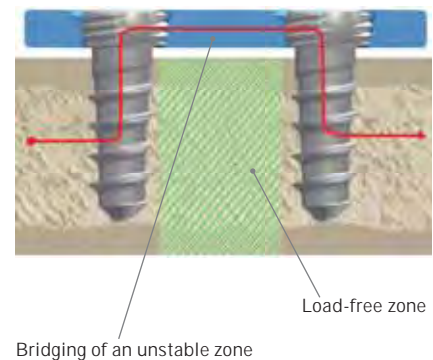
### INNOVATIVE TRILOCK LOCKING TECHNOLOGY

TriLock is a unique, multidirectional and angular stable locking technology

- High stability through frictional bracing of the screw head in the plate (spherical three-point wedge-locking)
- Variable angle of  $\pm 15^\circ$  in all directions enables optimal positioning of the screw
- The special locking contour of the screw head and plate hole permits precise intraoperative adjustability



Internal fixator principle



### INTERNAL FIXATOR PRINCIPLE

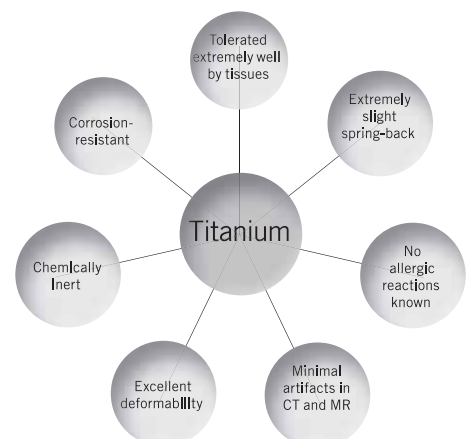
The TriLock plate-screw connection functions according to the principle of internal fixation and thus allows the bridging of unstable zones. In addition, it improves vascularization of the periosteum, since it is not necessary for the plate to be in direct contact with the bone surface.

### MATERIAL

Plates and screws are made from pure titanium (ASTM F67, ISO 5832-2) or from titanium alloy (ASTM F136, ISO 5832-3). Titanium is a safe and reliable material, which is biocompatible and corrosion-resistant, does not trigger any allergic reactions and, according to current understanding, can remain in the body indefinitely.

### BIOMECHANICS

Computer-optimized plate geometries ensure that the implants can withstand high mechanical stress with minimal plate thickness.



# Instruments

## APTUS Hand



- 1 Plate bending pliers in use
- 2 Plate cutting pliers
- 3 Self-holding mechanism screw/screwdriver
- 4 Color-coded instruments in the instrument tray
- 5 Measuring unit of the depth gauge

- Reduced instrument kit
- Intuitive application due to clear color coding
- Easy to use

#### SIMPLE INSTRUMENT KIT

The Medartis instruments are compact, ergonomically designed and easy to use.

- Depth gauge for single-handed use
- One screwdriver and one plate holding and positioning instrument each for 1.2/1.5 and 2.0/2.3
- One drill guide for all drill diameters
- One plate bending pliers for all plate sizes
- One plate cutting pliers each for plate sizes 1.2/1.5 and 2.0/2.3



#### CLEAR COLOR CODING CONCEPT

Twist drills and instruments have a consistent and clear color code which allows for intuitive use within the different system sizes.

APTUS 1.2 = red

APTUS 1.5 = green

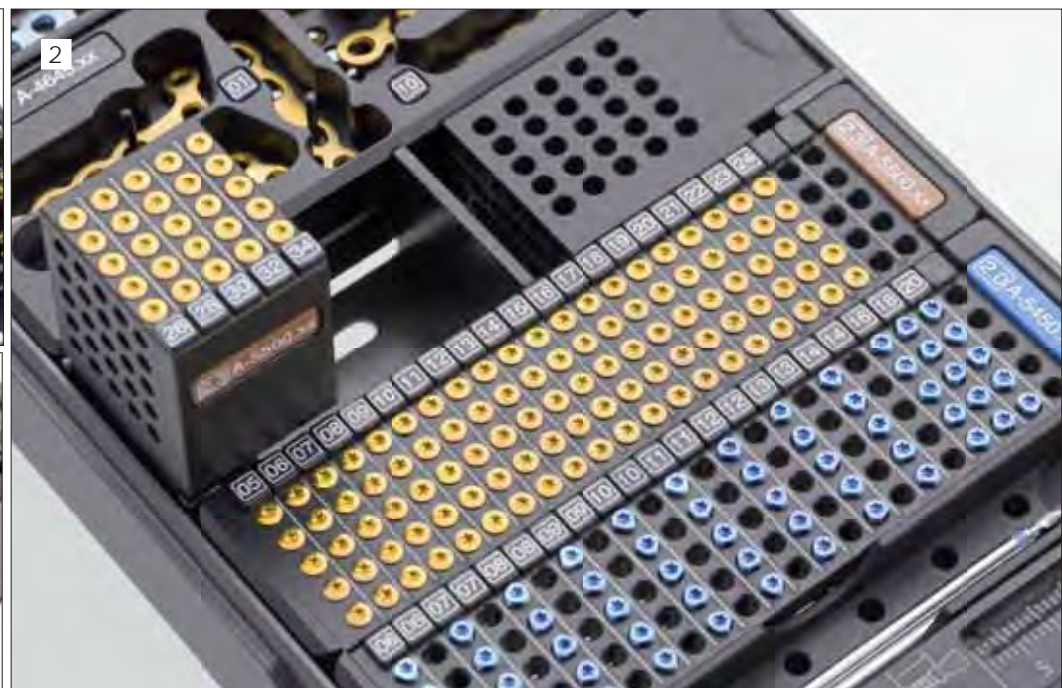
APTUS 2.0 = blue

APTUS 2.3 = brown



# Storage in Perfection

## APTUS Hand



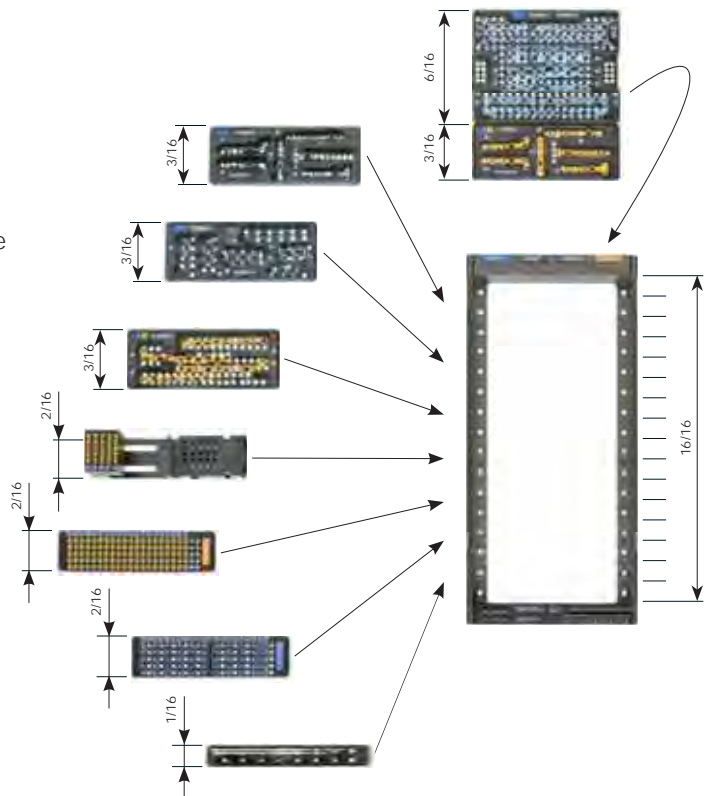
- 1 6/16 plate module
- 2 2/16 screw modules
- 3 Underside of base frame with fixed modules
- 4 Measuring and twist drill module
- 5 Color coding on the implant container

- Modular, economic, compact
- 16/16 – can be configured to suit the customer's need
- Clear and consistent color coding

### MODULAR CONTAINER CONCEPT

The base frame in the 16/16 grid can be freely combined with screw and plate modules of different sizes, allowing the customer to configure an individual APTUS Hand system.

- 16/16 Base frame
- 1/16 Twist drill module
- 1/16 + 2/16 Screw modules
- 3/16 – 6/16 Plate modules



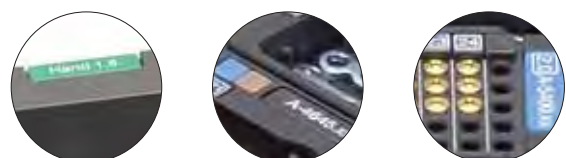
### INDIVIDUAL CONFIGURATION

Plates and screws may be combined freely in the implant containers. From a small basic set up to the complete product range, everything can be adapted to the needs of the individual user.



### FLEXIBLE COLOR CODING AND LABELING CONCEPT

The use of colored stickers in the implant container permits consistent and clear color coding of the individual implants and system sizes, ensuring clear identification of the plates and screws.



# Clinical Examples

## APTUS Hand

### Case 1 – Osseous extensor tendon avulsion of the distal phalanx



Preoperative lateral X-ray

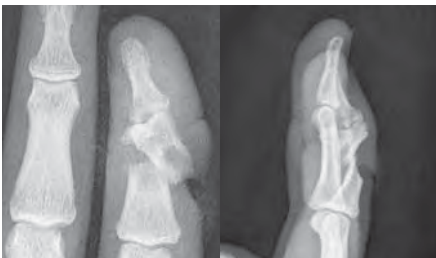


Intraoperative view of the avulsed fragment



Postoperative lateral X-ray

### Case 2 – Fracture of the middle phalanx II



Preoperative X-rays

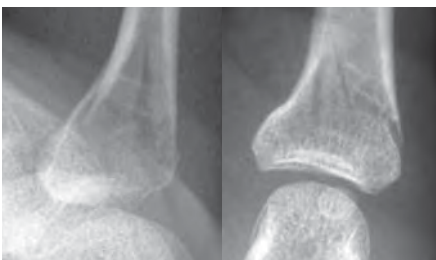


Open fracture



Fixation with a 1.2 / 1.5 grid plate

### Case 3 – Joint fracture of the proximal phalanx V



Preoperative X-rays



Repositioning of the depressed joint fracture with implantation of ceramic bone filler, fixation with a 1.2 / 1.5 T-plate and reconstruction of the extensor tendon aponeurosis

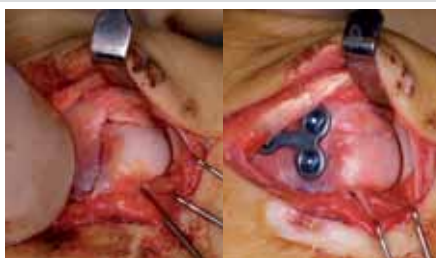


X-rays after healing

### Case 4 – Metacarpals II/III – head fractures



Preoperative X-ray



Manual repositioning and stabilization with a 2.0 angular stable plate



Postoperative oblique X-ray

### Case 5 – Metacarpal shaft fracture



Preoperative X-rays



Plate fixation with 2.0 / 2.3 compression plates



Postoperative X-rays

### Case 6 – PIP V Arthrodesis for 3<sup>rd</sup> recurrence of contracture



Clinical photograph of the extension capability prior to surgery



Cuneiform resection of the joint for correction of the extension and fixation with a 1.2 / 1.5 grid plate



Postoperative X-rays

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#### **HEADQUARTERS**

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