



medartis®

PRECISION IN FIXATION

INFORMATION ON THE PRODUCT RANGE

Wrist

APTUS®

## LITERATURE

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# APTUS® Wrist

## INTRODUCTION

Approaches for the treatment of distal radius fractures have been changing for years, with similar developments now slowly emerging in the treatment of fractures to the distal ulna. Increased expectations on the part of patients, as well as socio-economic factors, have resulted in the desire for perfect anatomical reconstruction and permanent repositioning. Very early mobilization is therefore facilitated in the postoperative treatment phase, with as little immobilization as possible.

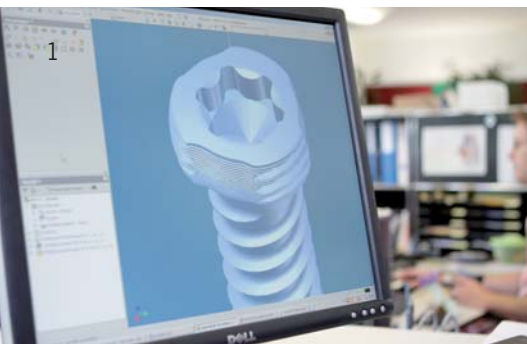
In collaboration with leading specialists, Medartis has developed the unique APTUS Wrist fixation system for fracture treatment and reconstructive surgery. APTUS implant plates with TriLock locking technology work according to the 'internal fixator' principle, stabilizing intra- and extra-articular fractures as well as completed correction osteotomies.

APTUS Wrist offers a versatile range of anatomically designed radius and ulna plates. The plates are available in different lengths and widths for volar, dorsal and/or lateral implantation to meet the high expectations of an optimal treatment outcome. Minimal profile heights and highly polished surfaces for minimizing tissue irritation are two outstanding features offered by the plates.

With the introduction of APTUS Wrist, Medartis has considerably enhanced the therapeutic diversity of the treatments available for fractures, osteotomies and pseudarthroses of the wrist.

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 wrist 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.

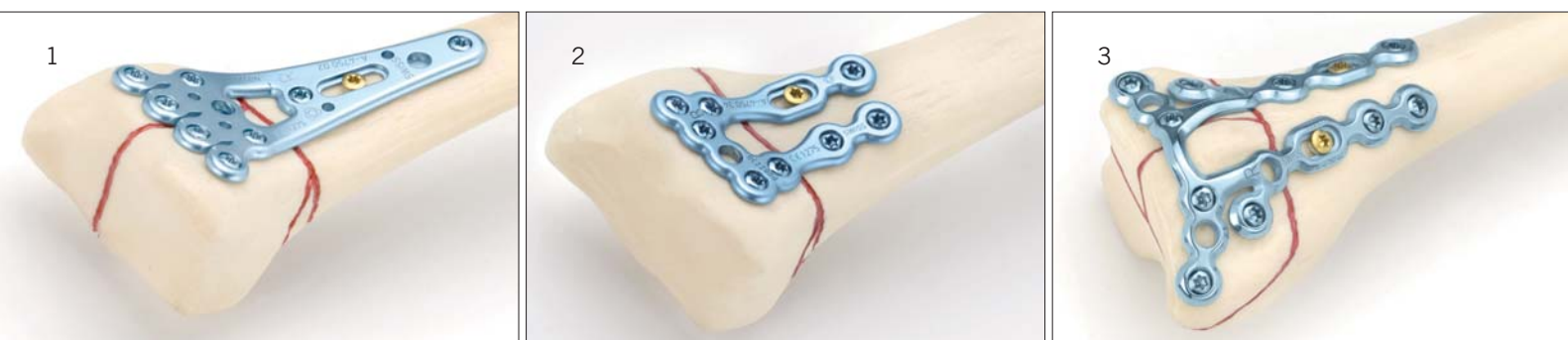
In order to fulfill the growing requirements of medical devices, our development teams engage in intensive knowledge exchange with our customers, partners and leading scientific institutes globally. Medartis’ international locations allow us to determine the needs of surgeons and patients directly on 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.

# One System - Many Possibilities

## APTUS Wrist

- For fractures, osteotomies and pseudarthrosis of the distal radius, distal ulna and wrist
- Consistent screw diameter of 2.5 mm
- Stable fracture fixation



## APTUS WRIST

### Trauma

Fractures can be of varying intensities and necessitate adaptation of the treatment methods, accordingly. The use of fixed-angle plates incorporating the 'internal fixator' principle has increased dramatically in recent years compared to conservative therapy. The shorter period of immobilization of the wrist, stable fracture fixation, improved restoration of the anatomical features, and a reduction in latent complications, are the clear advantages for using such plates. Medartis offers a large selection of plates for adequately resolving any type of fracture.

### Correction

Malunited fractures of the distal radius necessitate a second intervention in order to restore the physiological axes and ratios to the radioulnar and radiocarpal joints returning the load ratios to normal.

Correction plates must be used, depending on the correction required, to bridge a large, unstable zone.

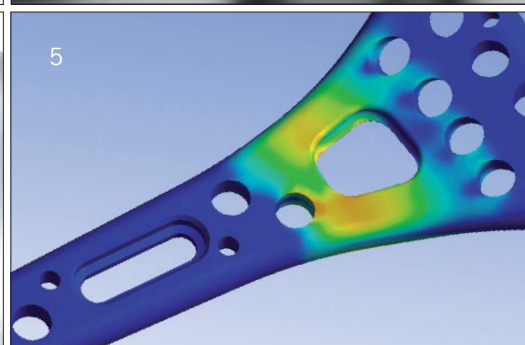
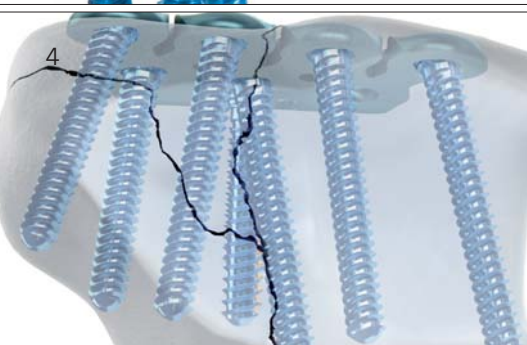
Consequently they should be comparatively more stable in order to be able to absorb more force. Medartis has plates of varying lengths and widths which account for the special demands of correction osteotomies.



- 1 Intra-articular fracture with volar TriLock fracture plate
- 2 Extra-articular fracture with volar TriLock frame plate
- 3 Intra-articular fracture with dorsal TriLock frame plate
- 4 Correction osteotomy with volar ADAPTIVE TriLock plate
- 5 Multi-fragment fracture with short distal ulna plate

# Anatomical Plate Design

## APTUS Wrist



- 1 ADAPTIVE TriLock distal radius plates in the module
- 2 Freely adjustable angle ( $\pm 15^\circ$ )
- 3 Distal ulna plate with screws
- 4 Detail of radius bone model with TriLock fracture plate
- 5 Finite element 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 treatment and correction osteotomy
- Multidirectional ( $\pm 15^\circ$ ) and angular stable fixation
- Low profile

#### PLATE RANGE

The range of plates available encompasses a large selection of different TriLock plates for fractures, osteotomies and pseudarthrosis of the distal radius, distal ulna and wrist

- Fracture plates
- Frame plates
- Correction plates
- ADAPTIVE plates
- Small fragment plates

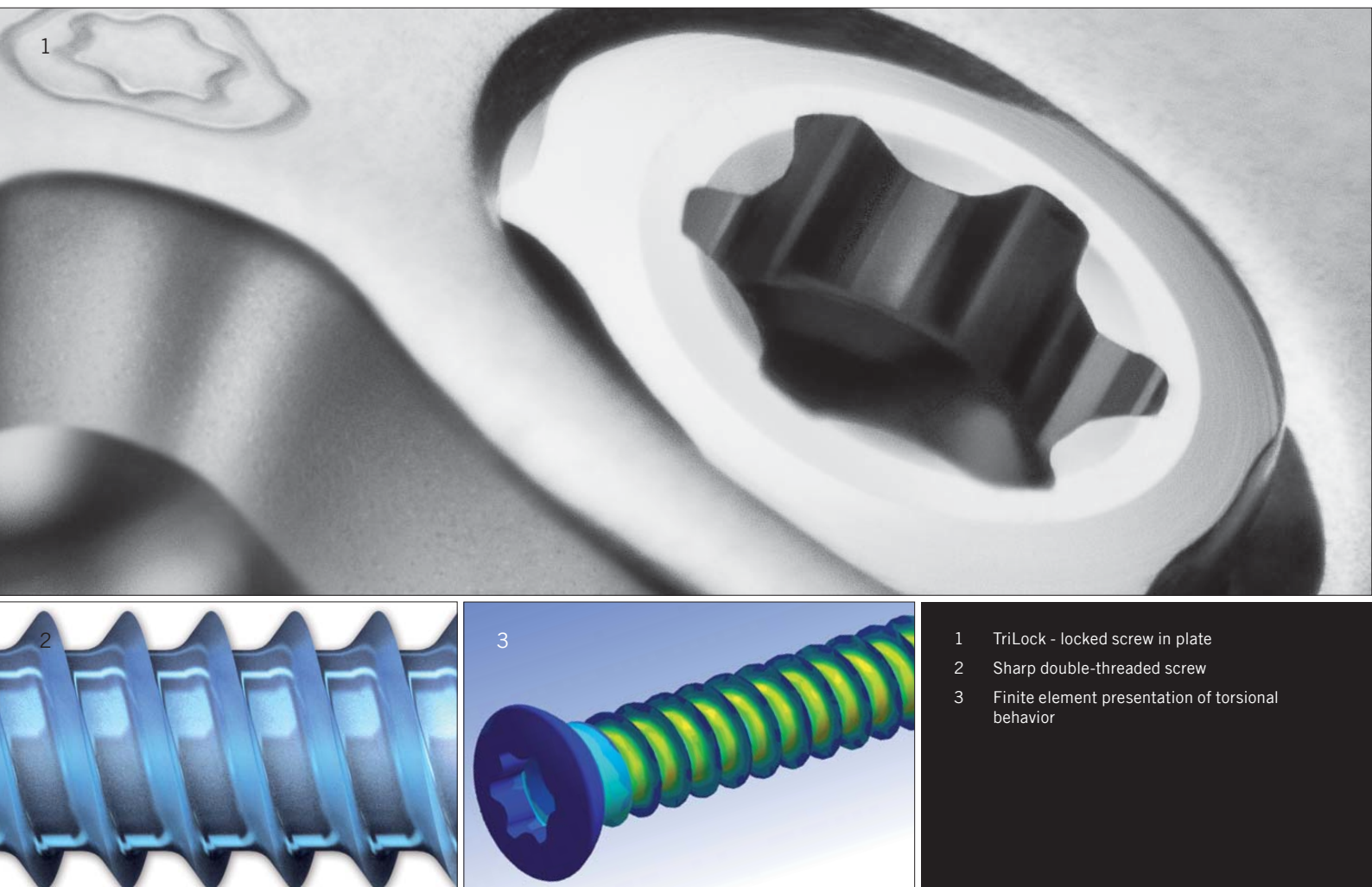
#### PLATE FEATURES

- Anatomically pre-contoured and fracture-specific implant designs for simple intraoperative application
- Optimal subchondral stability due to double-row screw arrangement in the distal area of the radius plates
- TriLock – variable angled locking of  $\pm 15^\circ$  in each plate hole for fracture-specific positioning of the plate
- No risk of cold welding
- Low profile even at the maximum adjusted screw angle of  $\pm 15^\circ$ , preserving the soft tissue
- Well-rounded edges and highly polished surface for maximum soft tissue protection
- K-wire holes to assist with temporary plate fixation and verification of implant position
- Early mobilization based on the 'internal fixator' principle
- Consistent 2.5 mm screw diameter throughout for intra-operative simplicity



# Superior Screw Technology

## APTUS Wrist



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

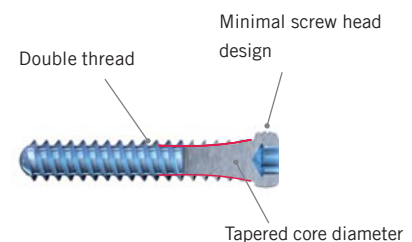
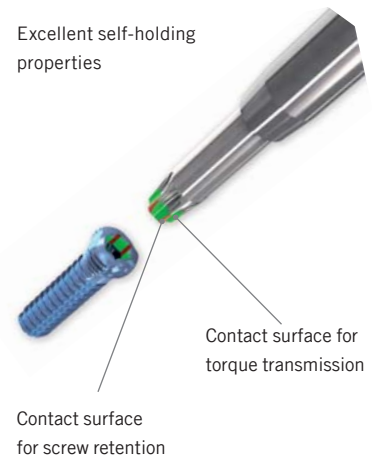
### SCREW OPTIONS

- Blue 2.5 TriLock screws (locking)
- Gold 2.5 cortical screws (fixation)
- Silver 2.5 TriLock Express screws (locking)



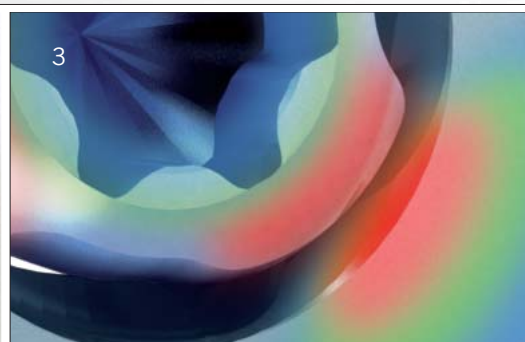
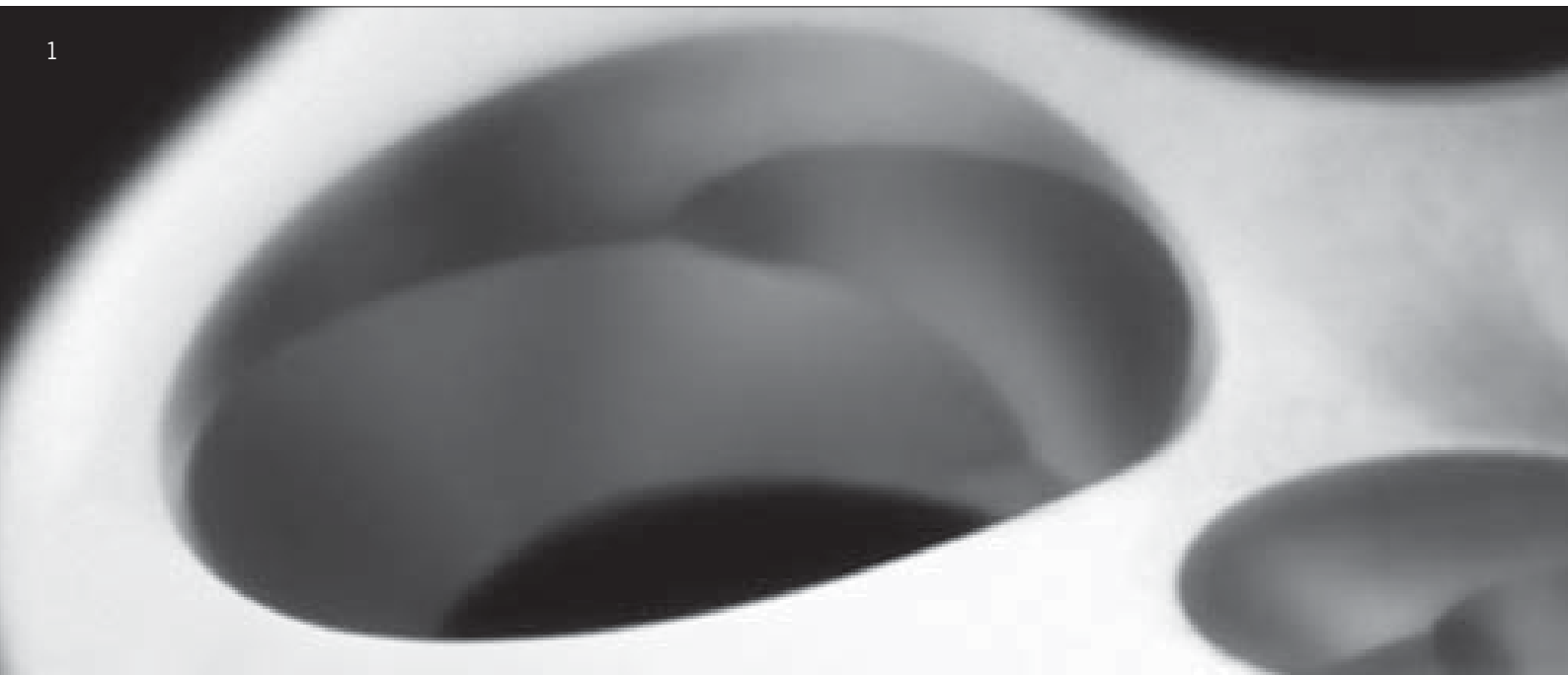
### SCREW FEATURES

- 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
- 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 Wrist



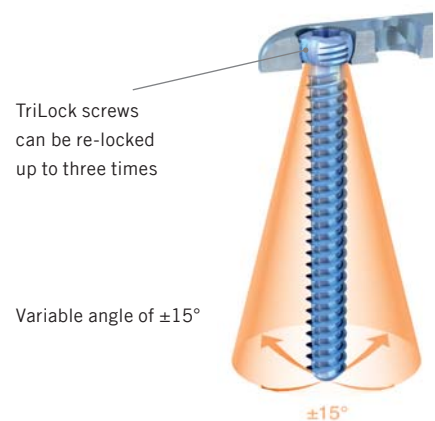
- 1 Plate hole with locking contour
- 2 Biomechanical testing of an implant
- 3 Spherical three-point wedge locking

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

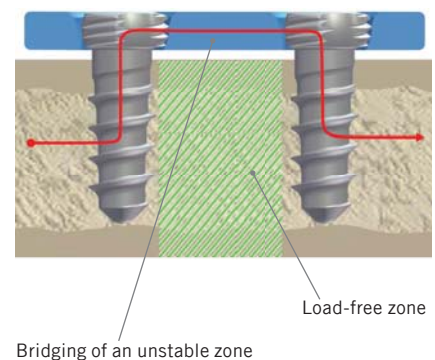
### INNOVATIVE TRILOCK LOCKING TECHNOLOGY

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

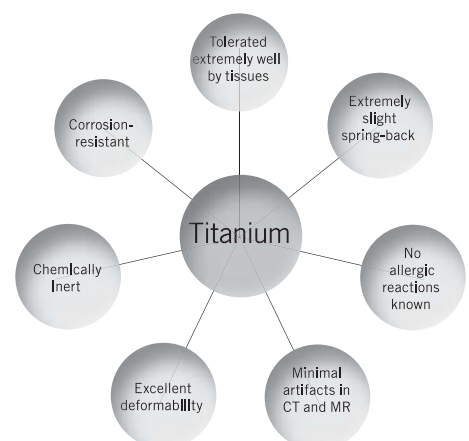
The TriLock plate-screw connection functions according to the principle of internal fixation and thus allows the bridging of unstable zones. In addition, it improves vascularization of the periosteum, since it is not necessary for the plate to be in direct contact with the bone surface.

### 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 Wrist



- 1 Plate bending pliers in use
- 2 Plate cutting pliers
- 3 Self-holding mechanism screw/screwdriver
- 4 Drilling and measuring with positioned drill guide block
- 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
- Screwdriver
- Drill guide
- Pair of plate bending pliers for various plate types
- Plate cutting pliers



### CLEAR COLOR CODING CONCEPT

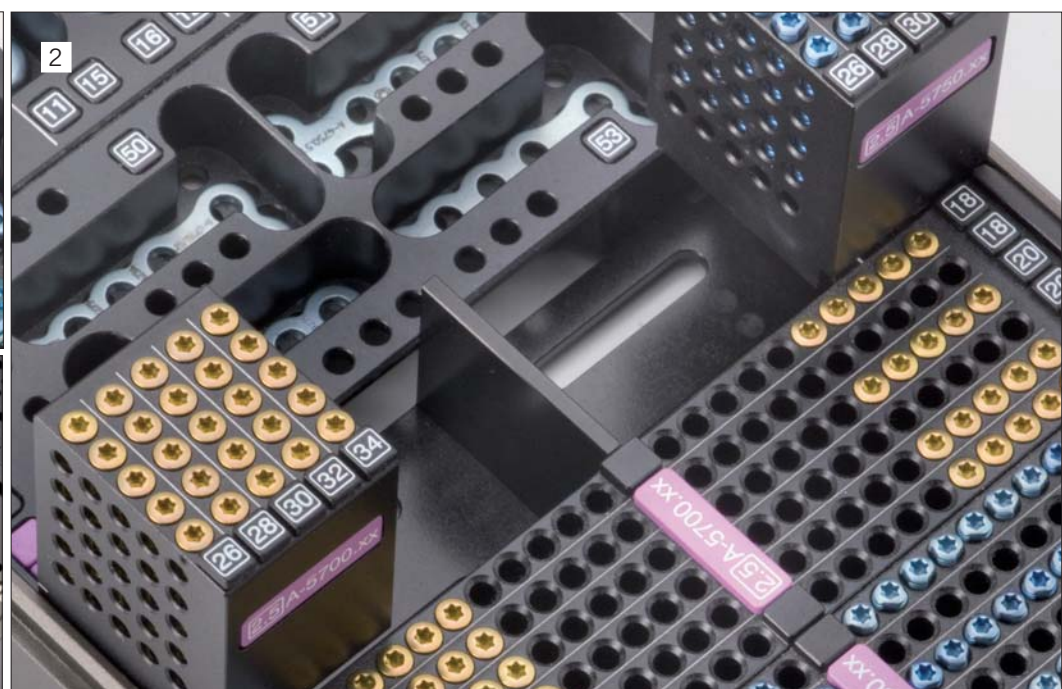
Twist drills and instruments have a consistent and clear color code which allows for intuitive use within each system size.

APTUS 2.5 = violet



# Storage in Perfection

## APTUS Wrist



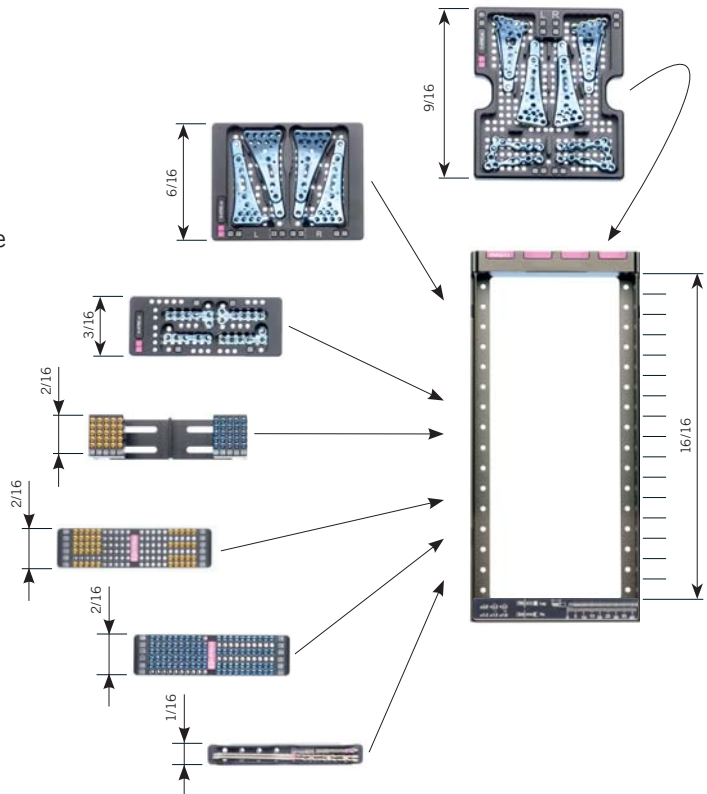
- 1 9/16 plate module
- 2 2/16 screw modules
- 3 Underside of base frame with fixed modules
- 4 Measuring and twist drill module
- 5 Color coding on the implant container

- 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 Wrist system.

- 16/16 Base frame
- 1/16 Twist drill module
- 2/16 Screw modules, incl. swivel version
- 3/16 - 9/16 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.



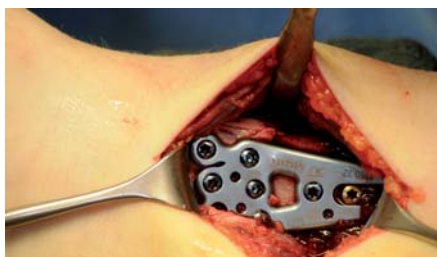
# Clinical examples

## APTUS Wrist

### Case 1 - 2.5 TriLock distal radius fracture plate, volar



Trauma case of a C3 fracture in a 47 year-old female patient



Intraoperative view of plate position



Postoperative X-ray control with anatomical reconstruction and subchondral screw position

### Case 2 - 2.5 TriLock distal radius correction plate, volar



Preoperative X-ray (lateral) with moderate malpositioning



Intraoperative view after fixation of distal screws



Postoperative X-ray (lateral) after healing of correction osteotomy

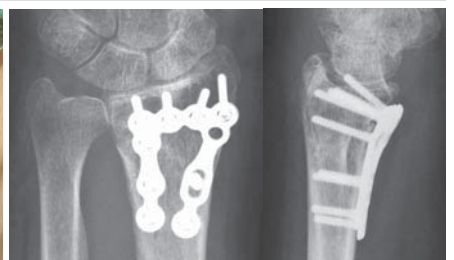
### Case 3 - 2.5 TriLock distal radius frame plate, volar



Trauma case of a C3 fracture in a 68 year-old female patient



Intraoperative view of positioning the plate as far distal as possible



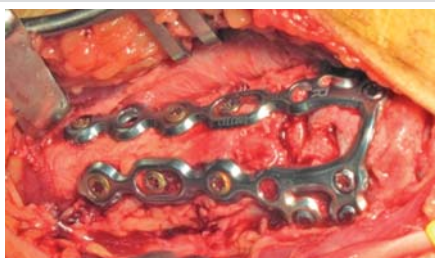
X-ray control 4 weeks postoperatively

With kind permission of: Prof. Hermann Krimmer, Ravensburg, Germany (1,2) | Dr. Christoph Ranft, Kiel, Germany (3) | Dr. Regula Steiger, Liestal, Switzerland (4)  
Dr. Richard Gelberman, St. Louis, USA (5) | Dr. Andrea Leti Acciaro, Modena, Italy (6)

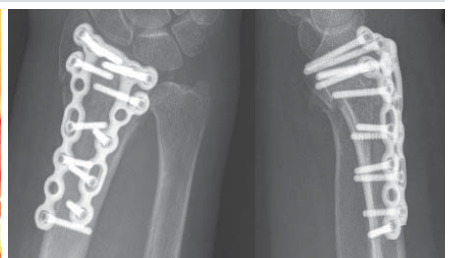
### Case 4 - 2.5 TriLock distal radius frame plate, dorsal



Clinical picture (lateral X-ray of fracture) of a 73 year-old female patient



Intraoperative view after insertion of 12 screws (6 fixation, 6 TriLock); bone defect filled with bone substitute

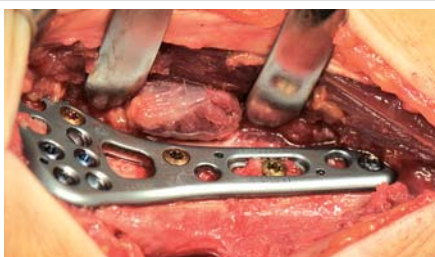


Postoperative X-ray control

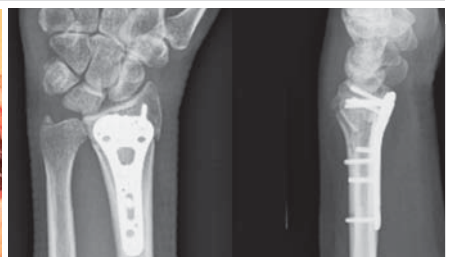
### Case 5 - 2.5 ADAPTIVE TriLock distal radius plate, volar



Preoperative X-rays



Intraoperative view



Postoperative X-ray control

Note: For ideal results, we recommend insertion of at least 3 TriLock screws into the first row and 2 TriLock screws into the second row of drill holes.

### Case 6 - 2.5 TriLock distal ulna plate, volar



Preoperative X-rays



Intraoperative view



Postoperative X-ray control with long distal ulna plate

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#### **HEADQUARTERS**

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