



# WINSTA-R Distal Radius System



► **Table of Contents**

|                                |   |    |
|--------------------------------|---|----|
| <b>Introduction</b>            | WINSTA-R System                         | 2  |
|                                | Indication                              | 2  |
| <b>Surgical Technique</b>      | Palmar Access for Radius Plate          | 3  |
|                                | Dorsal Access for Radius Plate          | 3  |
|                                | Positioning of the Radius Plate         | 4  |
|                                | Fixation of the Plate in the Slide Hole | 4  |
|                                | Distal Screwing                         | 5  |
|                                | Insertion of ML Screws                  | 6  |
|                                | Use of Locking Buttress Pins            | 7  |
|                                | Proximal Screwing                       | 7  |
|                                | Access Ulna Plate & Ulna Hook Plate     | 8  |
| Positioning of the Ulna Plates | 8                                       |    |
| <b>Product Information</b>     | Implants                                | 10 |
|                                | Instruments                             | 14 |
|                                | Templates                               | 15 |
|                                | MRI Safety Information                  | 17 |

**Note:**

The surgery instructions outlined below reflect the surgical procedure usually chosen by the clinical consultant. However, each surgeon must decide individually which course of action offers the best chance of success in the individual case.

## ► Introduction

### WINSTA-R System

- High stability with small implant dimensions.
- Use of multiaxial screws / buttress pins (**ML** Screws / **ML** Buttress Pins) with a deflection of  $\pm 10^\circ$  from the normal position permits high variability in the fixation of fragments, with minimal screw head protrusion.
- Rounded plate profile for optimal soft tissue protection.
- Simple and ergonomically designed instrument set with only one  $\varnothing$ -2.0-mm drill bit provides a high level of safety and security for the surgeon and the surgical staff.
- The locking buttress pins allow quick fixation of the fragments to the plate.

### WINSTA-R Distal Radius Plates

- The **WINSTA-R System** consists of several plates with anatomically correct shape for reconstruction of the “palmar tilt”, taking into account the Watershed Line.
- Additional dorsal support of the articular surface and the dorsal edge fragment via radius plates with a second row of screws.
- Locking plates for palmar and dorsal treatment.

### Indication

- Fixation of extra-articular and intra-articular fractures of the distal radius.

### WINSTA-R Distal Ulna Plates

- Anatomically preformed plates, side-specific for the right and the left ulna.
- Plate versions with and without distal hook.
- Plates with distal hooks for better fixation of the ulnar styloid process.

### Indication

- Fixation of capital and sub-capital fractures of the distal ulna.

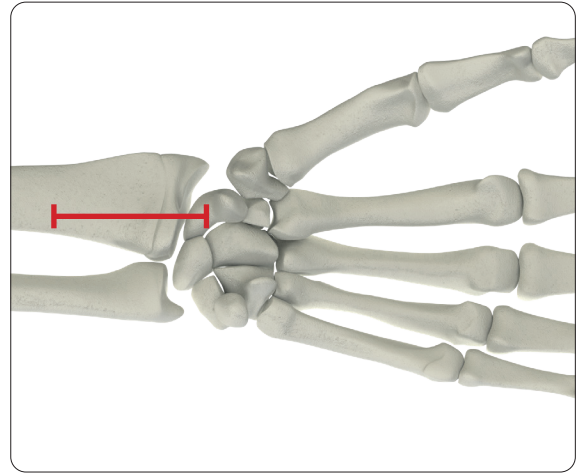
## ► Surgical Technique

### 1. Palmar access for radius plate

- On the palmar side, a straight skin incision parallel to the flexor carpi radialis tendon is created.
- Take care not to hurt the arteria radialis on the radial and the nervus medianus on the medial side.
- Detach the pronator quadratus on the radial side from the radial shaft.

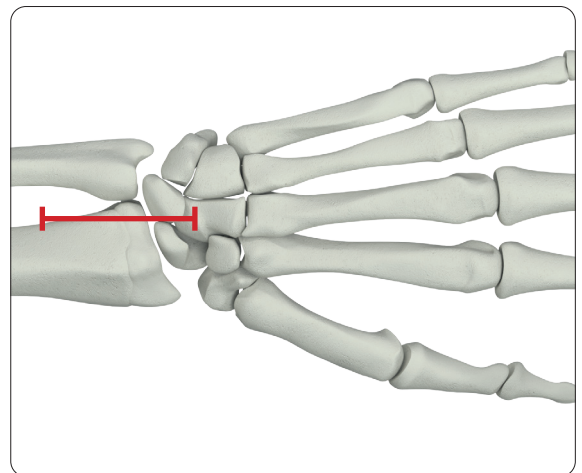
#### Note:

- In case of multifragmentary involvement of the joint fragment, the fragments should be left associated to facilitate ligamentotaxis.



### 2. Dorsal access for radius plate

- Dorsally, create a longitudinal incision over the distal radius, between the 2nd and 3rd dorsal extensor tendon compartment.
- Perform a longitudinal incision between the 1st and 2nd extensor tendon compartment to expose the extensor retinaculum.
- For easier access to the fracture site, carefully lift the 3rd extensor compartment (extensor pollicis longus), mobilise it proximally and distally and relocate it radially.
- Lift the second dorsal tendon compartment subperiostally radially and the fourth dorsal tendon compartment subperiostally ulnarly, to preserve the integrity of the compartments.





### 3. Positioning of the radius plate

#### Instruments

REF 11.90012.150      Kirschner Wire Ø 1.2 mm

- While applying tension to the fingers and in palmar flexion of the wrist, reduce the fracture until the joint fragment abuts against the distal end of the plate.
- In the event of a dorsal fragment zone it can be helpful to apply dorsal pressure onto this zone with one finger while filling the distal plate holes; this will ensure the retention of the fragments through the stabilising screw/pins inserted in anatomical position.
- Attention must be paid to correct reduction of the fracture.
- Once the fracture has been reduced into an anatomically correct position, the plate is fixed temporarily with Kirschner wires in the distal and proximal areas.



### 4. Fixation of the plate in the slide hole

#### Instruments

REF 10.20010.020(S)      Drill Bit Ø 2.0 mm  
REF 12.20060.017      Double Drill Guide 2.0 / 1.7

- The slot is filled with a cortical screw Ø 2.7 mm.
- The screw hole is pre-drilled using the drill bit via the double drill guide.



#### Instruments

REF 03.20100.040      Length Determination Instrument, for  
Screws up to 40 mm

- Next, the required screw length is determined using the length determination instrument.
- The length determination instrument is placed directly on the plate, and after hooking onto the opposite cortex, the value can be read.

**Instruments**

REF 03.20040.030 Screwdriver, hex 2.5 mm

- After the required screw length has been determined, the appropriate cortical screw can be inserted with the screwdriver.
- The screw is initially tightened only slightly, so that the plate position can be corrected distally and proximally as required.
- Check the plate position once more and correct it, if necessary, with image amplifier monitoring.
- Once the plate position is correct, the screws are finally tightened, and the plate is thus fixed on the radius shaft.



**5. Distal screwing**

**Instruments**

REF 10.20010.020(S) Drill Bit Ø 2.0 mm

REF 10.20060.047 Drill Guide 2.0

REF 03.20100.040 Length Determination Instrument, for Screws up to 40 mm

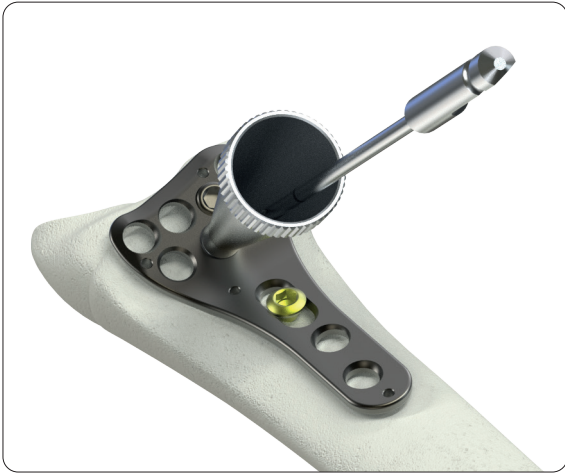
REF 03.20040.030 Screwdriver, hex 2.5 mm

- For locking cortical screws of Ø 3.0 mm, the scaled drill guide is screwed into the screw hole to be filled.
- When the drill bit is used, the required screw length can be read directly on the scale of the drill guide.
- Alternatively, for determining the required screw length the length determination instrument, as described before, can be used.
- After determination of the required screw lengths, the locking cortical screws are screwed in using the screwdriver.



**Note:**

- The drill holes for the locking cortical screws should be created only when the cortical screws are tightened. Otherwise, the plate position relative to the bone may slightly change, causing the drilling axes not to match exactly anymore.
- Ensure that both distal rows of screw holes are filled. The screws must not lie in the fracture zone.
- It is recommended to verify the subchondral position of the distal screw hole row by X-ray control.



## 6. Insertion of ML Screws

### Instruments

REF 10.20010.020(S) Drill bit Ø 2.0 mm

REF 10.20050.025 ML Drill Guide 2.0

REF 03.20100.040 Length Determination Instrument, for  
Screws up to 40 mm

REF 03.20040.030 Screwdriver, hex 2.5 mm

- For ML screws Ø 2.7 mm, the ML drill guide is used. The funnel-shaped drill guide is screwed into the corresponding screw hole and allows stepless multiaxial drilling in a cone of 20°.
- After drilling the screw length is determined using the length determination instrument.
- After determination of the required screw lengths, the ML screws are screwed in using the screwdriver.

### Note:

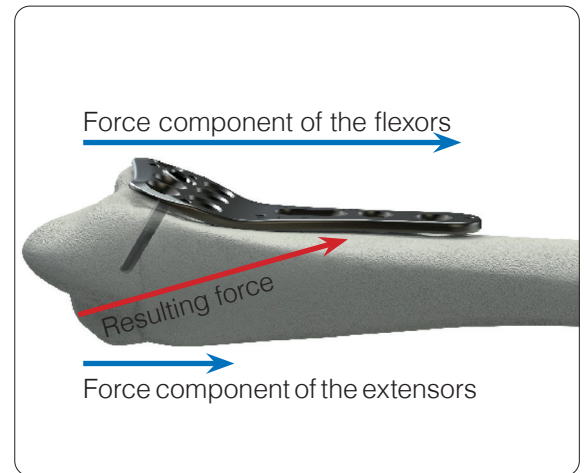
- The range of 20° must not be exceeded, since otherwise correct locking between screw and plate cannot be guaranteed.





### 7. Use of locking buttress pins

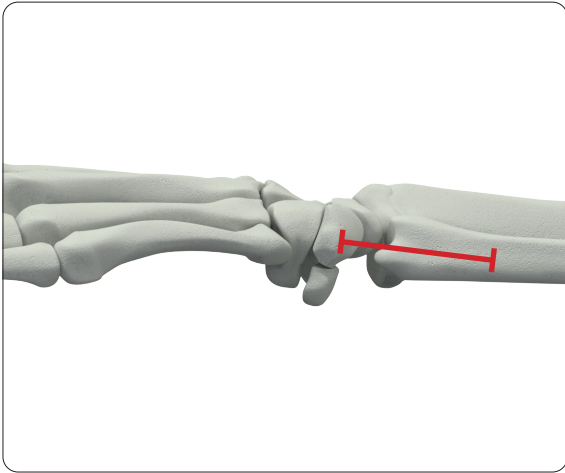
- The locking buttress pins allow quick and persistent fixation of the reduction. Due to the tensile forces on the forearm, the flexors clearly dominate, always creating a resultant force that pulls the fragments against the plate and onto the pins.
- It is advisable first to fill one of the two central holes of the distal row.
- Subsequently, the other holes should be filled with pins or screws.



### 8. Proximal screwing

- Here the procedure for inserting the proximal locking cortical screws corresponds to item 5.
- When all screw holes are filled, a final radiographic control is performed.





## 9. Access ulna plate & ulna hook plate

- Create a longitudinal incision over the palpable ulna.
- Take care not to hurt the dorsal branch of the ulnar nerve.
- After the distal ulna has been exposed, dissect subperiosteally, expose the fragments and reduce them.
- Carefully hold back the dorsal branch of the ulnar nerve.
- In order to facilitate the insertion and positioning of the ulna hook plate, notching of the capsular tissue at the level of the ulna styloid processus with two parallel incisions is helpful.



## 10. Positioning of the ulna plates

### Distal Ulna Hook Plate:

- Expose and reduce the fracture.
- The reduced fracture and the plate can be temporarily fixed by means of Kirschner wires.
- Place the hooks of the ulna hook plate around the tip of the ulnar styloid process as a reference for positioning.
- Then position the plate on the subcutaneous edge of the distal ulna and fixate in both the head and shaft.
- The distal ulna hook plate is fixated as described above with cortical screws, locking cortical screws or ML screws.
- Final radiographic control.

### Distal Ulna Plate:

- Expose and reduce the fracture.
- The reduced fracture and the plate can be temporarily fixed by means of Kirschner wires.
- First, fill the long hole with a cortical screw  $\varnothing$  2.7 mm as described in item 4.
- Then fixate the plate in the head and shaft areas as described above.
- Final radiographic control.





## ▶ Product Information

### Implants

#### WINSTA-R Distal Radius Plate

- 3-hole, left and right
- Material: Titanium
- Anodisation: Type II



| Article Number * | Shaft  | Orientation |
|------------------|--------|-------------|
| 10.11915.102     | 2-hole | right       |
| 10.11915.104     | 4-hole | right       |
| 10.11915.202     | 2-hole | left        |
| 10.11915.204     | 4-hole | left        |

#### WINSTA-R Distal Radius Plate

- 4-hole, left and right
- Material: Titanium
- Anodisation: Type II



| Article Number * | Shaft  | Orientation |
|------------------|--------|-------------|
| 10.11915.302     | 2-hole | right       |
| 10.11915.304     | 4-hole | right       |
| 10.11915.308     | 8-hole | right       |
| 10.11915.402     | 2-hole | left        |
| 10.11915.404     | 4-hole | left        |
| 10.11915.408     | 8-hole | left        |

#### WINSTA-R Distal Radius Plate

- 4-hole, left and right
- Material: Titanium
- Anodisation: Type II



| Article Number * | Shaft   | Orientation |
|------------------|---------|-------------|
| 10.11915.316     | 16-hole | right       |
| 10.11915.416     | 16-hole | left        |

#### WINSTA-R Distal Radius Plate

- 5-hole, left and right
- Material: Titanium
- Anodisation: Type II



| Article Number * | Shaft  | Orientation |
|------------------|--------|-------------|
| 10.11915.602     | 2-hole | right       |
| 10.11915.604     | 4-hole | right       |
| 10.11915.608     | 8-hole | right       |
| 10.11915.502     | 2-hole | left        |
| 10.11915.504     | 4-hole | left        |
| 10.11915.508     | 8-hole | left        |

#### WINSTA-R Distal Radius Plate

- 6-hole, left and right
- Material: Titanium
- Anodisation: Type II



| Article Number * | Shaft  | Orientation |
|------------------|--------|-------------|
| 10.11915.802     | 2-hole | right       |
| 10.11915.804     | 4-hole | right       |
| 10.11915.808     | 8-hole | right       |
| 10.11915.702     | 2-hole | left        |
| 10.11915.704     | 4-hole | left        |
| 10.11915.708     | 8-hole | left        |

\* All implants are also available in sterile. Therefore, add suffix "S" to article number.

| Article Number * | Shaft  | Orientation |
|------------------|--------|-------------|
| 10.11917.002     | 2-hole | right       |
| 10.11917.004     | 4-hole | right       |
| 10.11917.102     | 2-hole | left        |
| 10.11917.104     | 4-hole | left        |

| Article Number * | Shaft  | Orientation |
|------------------|--------|-------------|
| 10.11917.202     | 2-hole | right       |
| 10.11917.204     | 4-hole | right       |
| 10.11917.302     | 2-hole | left        |
| 10.11917.304     | 4-hole | left        |

| Article Number * | Shaft  | Orientation |
|------------------|--------|-------------|
| 10.11916.302     | 2-hole | right       |
| 10.11916.304     | 4-hole | right       |
| 10.11916.402     | 2-hole | left        |
| 10.11916.404     | 4-hole | left        |

| Article Number * | Shaft  | Orientation |
|------------------|--------|-------------|
| 10.11918.006     | 6-hole | right       |
| 10.11918.008     | 8-hole | right       |
| 10.11918.106     | 6-hole | left        |
| 10.11918.108     | 8-hole | left        |

| Article Number * | Shaft  | Orientation |
|------------------|--------|-------------|
| 10.11918.007     | 7-hole | right       |
| 10.11918.107     | 7-hole | left        |

**WINSTA-R Distal Radius Plate**

- 7-hole, left and right
- Material: Titanium
- Anodisation: Type II



**WINSTA-R Distal Radius Plate, narrow**

- 7-hole, left and right
- Material: Titanium
- Anodisation: Type II



**WINSTA-R Dorsal Radius Plate**

- 5-hole, left and right
- Material: Ti6Al4V
- Anodisation: Type II



**WINSTA-R Distal Ulna Hook Plate**

- 6 and 8 hole, left and right
- Material: Ti6Al4V
- Anodisation: Type II

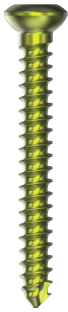


**WINSTA-R Distal Ulna Plate**

- 7-hole, left and right
- Material: Ti6Al4V
- Anodisation: Type II



\* All implants are also available in sterile. Therefore, add suffix "S" to article number.



## Cortical Screw Ø 2.7 mm, self-tapping

- Thread diameter: 2.7 mm
- Core diameter: 1.9 mm
- Head diameter: 5.0 mm
- Hexagon socket: 2.5 mm
- Material: Ti6Al4V

| Article Number * | Length |
|------------------|--------|
| 03.03527.010     | 10 mm  |
| 03.03527.012     | 12 mm  |
| 03.03527.014     | 14 mm  |
| 03.03527.016     | 16 mm  |
| 03.03527.018     | 18 mm  |
| 03.03527.020     | 20 mm  |
| 03.03527.022     | 22 mm  |
| 03.03527.024     | 24 mm  |
| 03.03527.026     | 26 mm  |
| 03.03527.028     | 28 mm  |
| 03.03527.030     | 30 mm  |
| 03.03527.032     | 32 mm  |
| 03.03527.034     | 34 mm  |
| 03.03527.036     | 36 mm  |



## ML Screw Ø 2.7 mm, self-tapping

- Thread diameter: 2.7 mm
- Core diameter: 1.9 mm
- Head diameter: 4.75 mm
- Hexagon socket: 2.5 mm
- Material: Ti6Al4V

| Article Number * | Length |
|------------------|--------|
| 03.03540.008     | 8 mm   |
| 03.03540.010     | 10 mm  |
| 03.03540.012     | 12 mm  |
| 03.03540.014     | 14 mm  |
| 03.03540.016     | 16 mm  |
| 03.03540.018     | 18 mm  |
| 03.03540.020     | 20 mm  |
| 03.03540.022     | 22 mm  |
| 03.03540.024     | 24 mm  |
| 03.03540.026     | 26 mm  |
| 03.03540.028     | 28 mm  |
| 03.03540.030     | 30 mm  |
| 03.03540.032     | 32 mm  |
| 03.03540.034     | 34 mm  |
| 03.03540.036     | 36 mm  |



## ML Buttress Pins Ø 2.0 mm

- Core diameter: 2.0 mm
- Head diameter: 4.75 mm
- Hexagon socket: 2.5 mm
- Material: Ti6Al4V

| Article Number | Length |
|----------------|--------|
| 10.03560.016   | 16 mm  |
| 10.03560.018   | 18 mm  |
| 10.03560.020   | 20 mm  |
| 10.03560.022   | 22 mm  |
| 10.03560.024   | 24 mm  |
| 10.03560.026   | 26 mm  |
| 10.03560.028   | 28 mm  |
| 10.03560.030   | 30 mm  |

\* All implants are also available in sterile. Therefor, add suffix "S" to article number.

| Article Number * | Length |
|------------------|--------|
| 10.03530.008     | 8 mm   |
| 10.03530.010     | 10 mm  |
| 10.03530.012     | 12 mm  |
| 10.03530.014     | 14 mm  |
| 10.03530.016     | 16 mm  |
| 10.03530.018     | 18 mm  |
| 10.03530.020     | 20 mm  |
| 10.03530.022     | 22 mm  |
| 10.03530.024     | 24 mm  |
| 10.03530.026     | 26 mm  |
| 10.03530.028     | 28 mm  |
| 10.03530.030     | 30 mm  |
| 10.03530.032     | 32 mm  |
| 10.03530.034     | 34 mm  |
| 10.03530.036     | 36 mm  |

| Article Number * | Length |
|------------------|--------|
| 10.03520.016     | 16 mm  |
| 10.03520.018     | 18 mm  |
| 10.03520.020     | 20 mm  |
| 10.03520.022     | 22 mm  |
| 10.03520.024     | 24 mm  |
| 10.03520.026     | 26 mm  |
| 10.03520.028     | 28 mm  |
| 10.03520.030     | 30 mm  |

| Article Number * | Length |
|------------------|--------|
| 03.05527.010     | 10 mm  |
| 03.05527.012     | 12 mm  |
| 03.05527.014     | 14 mm  |
| 03.05527.016     | 16 mm  |
| 03.05527.018     | 18 mm  |
| 03.05527.020     | 20 mm  |
| 03.05527.022     | 22 mm  |
| 03.05527.024     | 24 mm  |
| 03.05527.026     | 26 mm  |
| 03.05527.028     | 28 mm  |
| 03.05527.030     | 30 mm  |
| 03.05527.032     | 32 mm  |
| 03.05527.034     | 34 mm  |
| 03.05527.036     | 36 mm  |

### Locking Cortical Screw Ø 3.0 mm, self-tapping

- Thread diameter: 3.0 mm
- Core diameter: 1.9 mm
- Head diameter: 4.75 mm
- Hexagon socket: 2.5 mm
- Material: Ti6Al4V
- Anodisation: Type II



### Locking Buttress Pins Ø 2.0 mm

- Core diameter: 2.0 mm
- Head diameter: 4.75 mm
- Hexagon socket: 2.5 mm
- Material: Ti6Al4V
- Anodisation: Type II



### Locking Cortical Screw Ø 2.7 mm, self-tapping

- Thread diameter: 2.7 mm
- Core diameter: 1.9 mm
- Head diameter: 4.75 mm
- Hexagon socket: 2.5 mm
- Material: Ti6Al4V



\* All implants are also available in sterile. Therefore, add suffix "S" to article number.

## Instruments

11.90012.150 Kirschner Wire Ø 1.2mm,  
trocar tip, L 150mm



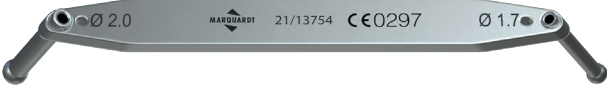
10.20010.020(S) Drill Bit Ø 2.0mm,  
AO-Coupling, L 112/84mm



03.20100.040 Length Determination Instrument, for  
Screws up to 40mm



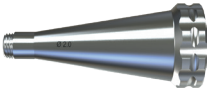
12.20060.017 Double Drill Guide 2.0/1.7



10.20060.047 Drill Guide 2.0, scaled



10.20050.025 ML Drill Guide 2.0



03.20040.030 Screwdriver, hex 2.5mm, ball handle,  
L 200/85mm



02.20120.015 Screw Forceps, self-holding





**Templates**

| Article Number | Shaft   | Orientation |
|----------------|---------|-------------|
| 10.21915.102   | 2 holes | right       |
| 10.21915.104   | 4 holes | right       |
| 10.21915.202   | 2 holes | left        |
| 10.21915.204   | 4 holes | left        |

**WINSTA-R Distal Radius Plate, 3/x holes**



| Article Number | Shaft   | Orientation |
|----------------|---------|-------------|
| 10.21915.302   | 2 holes | right       |
| 10.21915.304   | 4 holes | right       |
| 10.21915.402   | 2 holes | left        |
| 10.21915.404   | 4 holes | left        |

**WINSTA-R Distal Radius Plate, 4/x holes**



| Article Number | Shaft   | Orientation |
|----------------|---------|-------------|
| 10.21915.602   | 2 holes | right       |
| 10.21915.604   | 4 holes | right       |
| 10.21915.502   | 2 holes | left        |
| 10.21915.504   | 4 holes | left        |

**WINSTA-R Distal Radius Plate, 5/x holes**



| Article Number | Shaft   | Orientation |
|----------------|---------|-------------|
| 10.21915.802   | 2 holes | right       |
| 10.21915.804   | 4 holes | right       |
| 10.21915.702   | 2 holes | left        |
| 10.21915.704   | 4 holes | left        |

**WINSTA-R Distal Radius Plate, 6/x holes**





**WINSTA-R Distal  
Radius Plate, 7/x holes**

| Article Number | Shaft   | Orientation |
|----------------|---------|-------------|
| 10.21917.002   | 2 holes | right       |
| 10.21917.004   | 4 holes | right       |
| 10.21917.102   | 2 holes | left        |
| 10.21917.104   | 4 holes | left        |



**WINSTA-R Distal  
Radius Plate, 7/x holes, narrow**

| Article Number | Shaft   | Orientation |
|----------------|---------|-------------|
| 10.21917.202   | 2 holes | right       |
| 10.21917.204   | 4 holes | right       |
| 10.21917.302   | 2 holes | left        |
| 10.21917.304   | 4 holes | left        |



**WINSTA-R Distal  
Ulna Hook Plate**

| Article Number | Shaft   | Orientation |
|----------------|---------|-------------|
| 10.21918.006   | 6 holes | right       |
| 10.21918.106   | 6 holes | left        |



**WINSTA-R Distal  
Ulna Plate**

| Article Number | Shaft   | Orientation |
|----------------|---------|-------------|
| 10.21918.007   | 7 holes | right       |
| 10.21918.107   | 7 holes | left        |



## MRI Safety Information

Non-clinical testing has demonstrated that the plates range from Marquardt Medizintechnik is MR Conditional in accordance with the ASTM F2503-20 standard definitions. A patient with this device can be safely scanned in an MR system meeting the following conditions:

- Cylindrical-bore
- Horizontal magnetic field ( $B_0$ )
- Spatial field gradient lower than or equal to
  - **1.5 T:** 23.45 T/m (2345 G/cm)
  - **3.0 T:** 11.75 T/m (1175 G/cm)
- Radiofrequency (RF) field exposure:
  - RF excitation: Circularly Polarized (CP)
  - RF transmit coil: whole-body transmit coil
  - RF receive coil type: whole-body receive coil
  - Maximum permitted whole-body averaged specific absorption rate (SAR):  
Normal Operating Mode, 2 W/kg.
  - Scan duration and wait time:
    - 1.5 T:** 2 W/kg whole-body average SAR for **8min and 15s** of continuous RF (a sequence or back-to-back series/scan without breaks) followed by a wait time of **8min and 15s** if this limit is reached.
    - 3.0 T:** 2 W/kg whole-body average SAR for **6min and 19s** of continuous RF (a sequence or back-to-back series/scan without breaks) followed by a wait time of **6min and 19s** if this limit is reached.
- The plates are expected to produce a maximum temperature rise of 8.5 °C at 1.5 T and 6.9 °C at 3 T both after the scanning periods presented above.
- The presence of this implant may produce an image artifact. Some manipulation of scan parameters may be needed to compensate for the artifact. In non-clinical testing, the image artifact caused by the device extends approximately 83 mm from the device edge when imaged with a spin echo pulse sequence and 65 mm with a gradient echo, both at 1.5 T.
- Patients with uncompromised thermoregulation and under uncontrolled conditions or patients with compromised thermoregulation (all persons with impaired systemic or reduced local thermoregulation) and under controlled conditions (a medical doctor or a dedicated trained person can respond instantly to heat induced physiological stress).

### Note:

Undergoing an MRI scan, there is a potential risk for patients with a metallic implant. The electromagnetic field created by an MRI scanner can interact with the metallic implant, resulting in displacement of the implant, heating of the tissue near the implant, or other undesirable effects.











**Dieter Marquardt Medizintechnik GmbH**

Robert-Bosch-Straße 1 • 78549 Spaichingen, Germany  
Telefon +49 7424 9581-0 • Telefax +49 7424 501441  
info@marquardt-medizintechnik.de • www.marquardt-medizintechnik.de

CE 0297