# ITS.







All ITS plates are preformed anatomically as a matter of principle. If adjustment of the plate to the shape of the bone is required, this is possible by carefully bending gently in one direction once. Particular care is required when bending in the region of a plate hole, as deformation of the plate may lead to a failure of the locking mechanism. The plate must not be buckled or bent several times. This is particularly important in the case of titanium implants, to prevent material fatigue and subsequent failure. The method of bending is the conscious responsibility of the operating doctor; I.T.S. GmbH can accept no liability whatsoever for this.

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# Introduction

# • Preface

The Pelvic Reconstruction System is a proven osteosynthesis system for various fractures of the pelvis.

The special feature of this implant is the free choice of screw placement. The user is able to set any desired screw in any hole (either locking or non-locking screw).

The free choice of screw angulation (+/- I5°, see page I9) provides an advantage in fracture treatment, especially in the case of complex fractures.



# • Screws

# 37592-XX Cancellous Screw, locking, D=5.9mm 61353-110/280 Spiral Drill, D=3.5mm, L=110/280mm, AO Connector 54353-90/230-SH Screwdriver Shank, PRS, Solid, WS 3.5, L=90/230mm, AO Connector 30591-XX Cancellous Screw, D=5.9mm 61353-110/280 Spiral Drill, D=3.5mm, L=110/280mm, AO Connector 61353-110/280 Spiral Drill, D=3.5mm, L=110/280mm, AO Connector 61353-110/280 Spiral Drill, D=3.5mm, L=110/280mm, AO Connector 61353-110/280 Spiral Drill, D=3.5mm, L=110/280mm, AO Connector

#### 32455-XX Cortical Screw, D=4.5mm

- 61323-145/280 Spiral Drill, D=3.2mm, L=145/280mm, AO Connector
- 54353-90/230-SH Screwdriver Shank, PRS, Solid, WS 3.5, L=90/230mm, AO Connector



OPTIONAL <u>ON REQUES</u>T)

- 37455-XX Cortical Screw, locking, D=4.5mm
- 61323-145/280 Spiral Drill, D=3.2mm, L=145/280mm, AO Connector
- 54353-90/230-SH Screwdriver Shank, PRS, Solid, WS 3.5, L=90/230mm, AO Connector



# • Properties

#### Properties of the material:

- Plate material: Titanium
- Material of screws: TiAl6V4 ELI
- Easier removal of the implant after the fracture has healed
- Improved fatigue strength of the implant
- Reduced risk of cold welding
- Reduced risk of inflammation and allergy

#### Properties of the implant:

- Multi-directional Locking
- Can be anatomically shaped (with bending pliers and setting instruments)
- Curved plate in 2 different degrees R88 & RI08
- Bending templates (to avoid repeated in situ attachment and readjustment)
- Plate profile of the Straight Plate, Symphysis Plate: 4.0mm
- Plate profile of the SIJ Plate (5-hole & Closed), Curved Plate (R88 & RI08): 2.5mm



# Indications, Contraindications & Time of operation

#### Indications:

• All pelvic injuries

#### Contraindications:

- Existing infections in the fracture zone and operation area
- Common situations that do not allow osteosynthesis
- Obesity
- Lack of patient compliance

#### Time of operation:

• Immediately after trauma or delayed

Intemnded purpose

The Pelvic Reconstruction Plate System is intended to treat fractures in the pelvic region: acetabular fractures, symphyseal fractures, pelvic ring fractures, iliac fractures, ilio-iliac distance osteosynthesis, fractures of the quadrilateral surface, SIJ fractures.

# Surgical Technique

# Instruments

#### Spike:

• For fixation of the plate to bone fragments where screw fixation is not possible because of the anatomic situation







## PRS Extension System:

- Especially complex fractures can therefore be treated more simply
- The PRS Extension System expands the range of indications, due to the fact that any PRS plate can be combined with one or more plates





#### Bending Forceps:

 For fine-adjustment of the radius of the curved plate





### Bending Iron:

• To form the plate to the respective pelvic region





# Application of Acetabular Plate

- Access by means of Kocher-Langenbeck approach, possibly using trochanter-flip ٠ osteotomy and surgical luxation
- Reduction and temporary fixation using a K-wire ٠
- Shaping of the bending template ٠
- Appropriate final adjustment of the plate ٠
- Application of the plate and temporary fixation using spikes and fluoroscopic or X-ray • inspection
- Finally, insertion of cortical or cancellous screws (either locking or non-locking) into • the holes of the plate
- Fluoroscopic or X-ray inspection •
- Drainage of the area and layered closure of the wound (refixation of greater trochanter if required)
- Subsequent control of plate and screw position under fluoroscopy

















**Curved Plate** Radius 108mm









# • Reconstr. of Anterior Pelvic Ring using Reconstr. Plate

- llio-inguinal approach or possibly Stoppa approach ٠
- Reduction using Weber or Jungbluth forceps, Schanz screw and temporary K-wire fixation if required
- Attachment and adjustment of appropriate bending template, with fluoroscopic or X-ray inspection if required
- Adjustment and setting of reconstruction plate on the bending template using setting instruments or bending pliers
- Attachement of the plate and temporary fixation using spikes and fluoroscopic or X-ray inspection
- Finally, insertion of cortical or cancellous screws (either locking or non-locking)
- Conclude with fluoroscopic or X-ray inspection
- Drainage, closure of wound
- Subsequent control of plate and screw position under fluoroscopy











#### **Curved Plate** Radius 88mm

**Curved Plate** Radius 108mm











# Application of Symphysis Plate

- Lower medial laparotomy (emergency) or Pfannenstiel incision
- Extra-peritoneal opening of the pelvis minor in the linea alba
- Notch the muscle attachment of the muscle rectus abdominis from inside, if possible do not sever laterally
- Resection using pointed reduction or pelvic reduction forceps
- Positioning of 4 or 6-hole plate superiorly (adjust using setting instruments if required)
- Temporary fixation using spikes and fluoroscopic or X-ray inspection
- Finally, insertion of cortical or cancellous screws (either locking or non-locking)
- Drainage of retropubic space, closure of the wound
- Subsequent control of plate and screw position under fluoroscopy





### Symphysis Plate



# • Application of SIJ Plate

- Antero-lateral approach or first window in the context of an ilio-inguinal approach
- Adjustment of sacroiliac joint with Hohmann retractors
- Resection using pointed reduction or pelvic reduction forceps
- Adjustment of a double-hole plate or double L-plates
- Temporary fixation using spikes, fluoroscopy or X-ray inspection
- Finally, insertion of cortical or cancellous screws (either locking or non-locking)
- Drainage, closure of wound
- Subsequent control of plate and screw position under fluoroscopy



SIJ Plate 5-hole

SIJ Plate Closed



# Ilio-Iliac Distance Osteosynthesis

- Approach: bilateral superior 5 cm long incision from the anterior inferior to the posterior superior
- Bilateral exposure of the rear iliac crest
- Reduction using Schanz screw, longitudinal traction on leg, if necessary with the help
   of reduction forceps
- Determination of plate length
- Chisel off plate bearing (approx. 4 mm deep)
- Bend the plate from one side. Push the plate through behind the sacrum. Bend the plate on the other side in situ
- Adjust plate and insert both screws on iliac crest. Alternate tightening of screws
- Insert locking screws in both holes of the short side piece of the plate, at the same time making sure that the screwing angle is 10-15° to the plane of the already attached screw on iliac crest (to prevent collision of the screws - this is not a problem when using ITS. locking screws)
- Drainage, closure of wound
- Subsequent control of plate and screw position under fluoroscopy















Straight Plate



# • SIJ Screw Fixation

- Approach: abdominal position, lateral stab incision after fluoroscopic inspection
- Position the guide wire under fluoroscopic inspection, alternating in inlet and outlet view or with 2D or 3D navigation
- Determine the length and position of the cannulated self-drilling D=7.3mm screw with spacer disk. (it is necessary to drill into cortical bone only when bone is very hard)
- Final X-ray inspection and wound closure









# Postoperative treatment

• The postoperative treatment may vary depending on the patients age, bone quality or type of fracture

# • Explantation

If desired by the patient, the implant can be removed.

Removal should be performed at the earliest 1 1/2 years later or after radiographic verification of the healed bone.

The problem of cold welding was resolved by using a special surface treatment (for further information see page 19).

# Information



# • Locking

#### Locking works because:

- Screw material (TiAlV) is slightly harder than plate material (Titanium Grade 2)
- Screw head **forms** thread into the plate (no cutting)

#### **Benefits**:

- ± I5° and Locking
- No pre threading
- No cold welding
- No debris
- You can re-set the screw up to 3 times



#### Chemical process - anodization in a strong alkaline solution\*

#### Type III anodization

# Type II anodization

Dotize®

Dotize

- Layer thickness 60-200nm
  - + Different colors
  - Implant surface remains sensitive to: Chipping Peeling Discoloration

#### Layer thickness 2000-10 000nm

- + Film becomes an interstitial part of the titanium
- No visible cosmetic effect



#### Anodization Type II leads to following benefits\*

- Oxygen and silicon absorbing conversion layer
- Decrease in protein adsorption
- Closing of micro pores and micro cracks
- Reduced risk of inflammation and allergy
- Hardened titanium surface
- Reduced tendency of cold welding of titanium implants
- Increased fatigue resistance of implants
- Improved wear and friction characteristics



# • Order list

Symphysis Plate, 4-hole Symphysis Plate, 6-hole	21161-4 21161-6	000000
SII Plate 5-hole Right	21171-5	0000
SUPlate 5-hole Left	21172-5	0000
SIJ Plate, 4-hole, Closed	21173-4	õõ
PRS Plate, 10-hole, Straight	21181-10	000000000
PRS Plate, 11-hole, Straight	21181-11	
PRS Plate, 12-hole, Straight	21181-12	
PRS Plate, 13-hole, Straight	21181-13	
PRS Plate, 14-hole, Straight	21181-14	
PRS Plate, 4-hole, Curved, R88	21194-4	9
PRS Plate, 5-hole, Curved, R88	21194-5	~00000°
PRS Plate, 6-hole, Curved, R88	21194-6	
PRS Plate, 7-hole, Curved, R88	21194-7	
PRS Plate, 8-hole, Curved, R88	21194-8	
PRS Plate, 10-hole, Curved, R88	21194-10	
PRS Plate, 12-hole, Curved, R88	21194-12	
PRS Plate, 14-hole, Curved, R88	21194-14	
PRS Plate, 16-hole, Curved, R88	21194-16	
PRS Plate, 4-hole, Curved, R108	21195-4	0000000
PRS Plate, 5-hole, Curved, R108	21195-5	0000000
PRS Plate, 6-hole, Curved, R108	21195-6	
PRS Plate, 7-hole, Curved, R108	21195-7	
PRS Plate, 8-hole, Curved, R108	21195-8	
PRS Plate, 10-hole, Curved, R108	21195-10	
PRS Plate, 12-hole, Curved, R108	21195-12	
PRS Plate, 14-hole, Curved, R108	21195-14	
PRS Plate, 16-hole, Curved, R108	21195-16	
Sterilization Tray, PRS, Plates	50167	
Mold, 4-hole, Curved, R88	67194-4	
Mold, 5-hole, Curved, R88	67194-5	
Mold, 6-hole, Curved, R88	67 94-6	
Mold, 7-hole, Curved, R88	67194-7	
Mold, 8-hole, Curved, R88	67194-8	
Mold, 10-hole, Curved, R88	67194-10	
Mold, 12-hole, Curved, R88	67194-12	
Mold, 14-hole, Curved, R88	67194-14	
Mold, 16-hole, Curved, R88	67194-16	
Mold, 4-hole, Curved, R108	67195-4	
Mold, 5-hole, Curved, R108	67195-5	
Mold, 6-hole, Curved, R108	67195-6	
Mold, 7-hole, Curved, R108	67195-7	
Mold, 8-hole, Curved, R108	67195-8	
Mold, 10-hole, Curved, R108	67195-10	
Mold, 12-hole, Curved, R108	67195-12	
Mold, 14-hole, Curved, R108	67195-14	
Mold, 16-hole, Curved, R108	67195-16	

Bending Forcep, Left, Right, Inwards Counter Bending Forcep, Left, Right, Outwards	66251-1 66251-2	
Bending Iron, PRS Plate	66252-14	
Sterilization Tray, PRS, Plates	50167	
Sterilization Tray, PRS, Instruments	50168	
Cancellous Screw, Locking, D=5.9mm, L=16mm Cancellous Screw, Locking, D=5.9mm, L=20mm Cancellous Screw, Locking, D=5.9mm, L=24mm Cancellous Screw, Locking, D=5.9mm, L=28mm Cancellous Screw, Locking, D=5.9mm, L=32mm Cancellous Screw, Locking, D=5.9mm, L=36mm Cancellous Screw, Locking, D=5.9mm, L=40mm Cancellous Screw, Locking, D=5.9mm, L=44mm Cancellous Screw, Locking, D=5.9mm, L=48mm	37592-16 37592-20 37592-24 37592-28 37592-32 37592-36 37592-40 37592-40 37592-44 37592-48	
Cancellous Screw, Locking, D=5.9mm, L=52mm Cancellous Screw, Locking, D=5.9mm, L=56mm Cancellous Screw, Locking, D=5.9mm, L=60mm	37592-52 37592-56 37592-60	
Cancellous Screw, D=5.9mm, L=16mm, Threaded Cancellous Screw, D=5.9mm, L=20mm, Threaded Cancellous Screw, D=5.9mm, L=24mm, Threaded Cancellous Screw, D=5.9mm, L=28mm, Threaded Cancellous Screw, D=5.9mm, L=32mm, Threaded Cancellous Screw, D=5.9mm, L=36mm, Threaded Cancellous Screw, D=5.9mm, L=40mm, Threaded Cancellous Screw, D=5.9mm, L=44mm, Threaded Cancellous Screw, D=5.9mm, L=44mm, Threaded Cancellous Screw, D=5.9mm, L=48mm, Threaded Cancellous Screw, D=5.9mm, L=52mm, Threaded Cancellous Screw, D=5.9mm, L=56mm, Threaded Cancellous Screw, D=5.9mm, L=60mm, Threaded	30591-16 30591-20 30591-24 30591-28 30591-32 30591-36 30591-40 30591-40 30591-44 30591-48 30591-52 30591-56 30591-60	
Cortical Screw, D=4.5mm, L=16mm, Cort. Thread Cortical Screw, D=4.5mm, L=20mm, Cort. Thread Cortical Screw, D=4.5mm, L=24mm, Cort. Thread Cortical Screw, D=4.5mm, L=28mm, Cort. Thread Cortical Screw, D=4.5mm, L=32mm, Cort. Thread Cortical Screw, D=4.5mm, L=36mm, Cort. Thread Cortical Screw, D=4.5mm, L=40mm, Cort. Thread Cortical Screw, D=4.5mm, L=44mm, Cort. Thread Cortical Screw, D=4.5mm, L=48mm, Cort. Thread Cortical Screw, D=4.5mm, L=52mm, Cort. Thread Cortical Screw, D=4.5mm, L=52mm, Cort. Thread Cortical Screw, D=4.5mm, L=56mm, Cort. Thread Cortical Screw, D=4.5mm, L=60mm, Cort. Thread	32455-16 32455-20 32455-24 32455-28 32455-32 32455-36 32455-40 32455-40 32455-44 32455-48 32455-52 32455-56 32455-60	

# • Order list

Spike, SW 7, PRS Set	70301-7	sinne
Socket Spanner with handle, WS 7, L=350mm	560701-350	
Screwdriver Shank PRS, WS 3.5mm, L=90mm, AO Connector Screwdriver Shank PRS, WS 3.5mm, L=230mm, AO Connector	54353-90SH 54353-230SH	
Handle, 25mm, AO Connector Screwdriver, WS 3.5, Conic, self-holding	53011 56352-SH	
Spiral Drill, D=3.2mm, L=280mm, AO Connector Spiral Drill, D=3.2mm, L=145mm, AO Connector Spiral Drill, D=3.5mm, L=280mm, AO Connector Spiral Drill, D=3.5mm, L=110mm, AO Connector	61324-280 61323-145 61353-280 61353-110	
Depth Gauge f. 4.5/5.9mm, gauge length 110mm	9-114	
Drill Guide, D=2.5/3.5mm	62252	
Screw Tweezers, SH 8cm	33.839.09	
Drill Guide, Long, D=3.5mm, PRS Plate	62351	
Sterilization Tray, PRS, Screws, Instruments	50169	
Sterilization Tray, PRS System	50225	

For detailed cleaning and sterilization instructions, please refer to package insert.

#### Special sizes & instruments optional on request \*

Fixation Screw, PRS Upgrade System Bolt, PRS Upgrade System Screwdriver WS 2.5. Self-Holding Sleeve	70302 70303 56252	Î 8
	30232	
Spike Short	70304	<b></b>
Cancellous Screw, Locking, D=5.9mm, L=65mm	37592-65	(MARCHARD AND AND AND AND AND AND AND AND AND AN
Cancellous Screw, Locking, D=5.9mm, L=70mm	37592-70	
Cancellous Screw, Locking, D=5.9mm, L=75mm	37592-75	
Cancellous Screw, Locking, D=5.9mm, L=80mm	37592-80	
Cancellous Screw, Locking, D=5.9mm, L=85mm	37592-85	
Cancellous Screw, Locking, D=5.9mm, L=90mm	37592-90	
Cancellous Screw, Locking, D=5.9mm, L=95mm	37592-95	
Cancellous Screw, Locking, D=5.9mm, L=100mm	37592-100	
Cancellous Screw, Locking, D=5.9mm, L=105mm	37592-105	
Cancellous Screw, Locking, D=5.9mm, L=110mm	37592-110	
Cancellous Screw, Locking, D=5.9mm, L=115mm	37592-115	
Cancellous Screw, Locking, D=5.9mm, L=120mm	37592-120	
Cancellous Screw, D=5.9mm, L=65mm	30591-65	Contractor
Cancellous Screw, D=5.9mm, L=70mm	30591-70	
Cancellous Screw, D=5.9mm, L=75mm	30591-75	
Cancellous Screw, D=5.9mm, L=80mm	30591-80	
Cancellous Screw, D=5.9mm, L=85mm	30591-85	
Cancellous Screw, D=5.9mm, L=90mm	30591-90	
Cancellous Screw, D=5.9mm, L=95mm	30591-95	
Cancellous Screw, D=5.9mm, L=100mm	30591-100	
Cancellous Screw, D=5.9mm, L=105mm	30591-105	
Cancellous Screw, D=5.9mm, L=110mm	30591-110	
Cancellous Screw, D=5.9mm, L=115mm	30591-115	
Cancellous Screw, D=5.9mm, L=120mm	30591-120	
Cortical Screw, D=4.5mm, L=65mm	32455-65	Comment.
Cortical Screw, D=4.5mm, L=70mm	32455-70	
Cortical Screw, D=4.5mm, L=75mm	32455-75	
Cortical Screw, D=4.5mm, L=80mm	32455-80	
Cortical Screw, D=4.5mm, L=85mm	32455-85	
Cortical Screw, D=4.5mm, L=90mm	32455-90	
Cortical Screw, D=4.5mm, L=95mm	32455-95	
Cortical Screw, D=4.5mm, L=100mm	32455-100	
Cortical Screw, D=4.5mm, L=105mm	32455-105	
Cortical Screw, D=4.5mm, L=110mm	32455-110	
Cortical Screw, D=4.5mm, L=115mm	32455-115	
Cortical Screw, D=4.5mm, L=120mm	32455-120	

For detailed cleaning and sterilization instructions, please refer to package insert.



# • Notes






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