

SLS

Straight Locking Plates System

CAUTION: Federal Law (USA) restricts this device to sale by or on the order of a board certified physician. WARNING: If there is no sufficient bone healing, wrong or incomplete postoperative care, plate might break. 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

ITS. provides various Straight Locking Plates with different plate strengths and lengths covering a wide range of indications for shaft fractures.

The special feature of these implants 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 (except long hole).

The free choice of screw angulation (+/- I5°, see page I7) provides an advantage in fracture treatment, especially in the case of complex fractures.



• Screws Straight Locking Plate 1.5/2.0mm

3735I-XX-N 6I273-I00 56252	Cortical Screw, locking, D=3.5mm, SH Spiral Drill, D=2.7mm, L=100mm, AO Connector Screwdriver, WS 2.5, self-holding sleeve	(Carrena properties to the contraction of the contr	
3235I-XX 61273-100 56252	Cortical Screw, D=3.5mm Spiral Drill, D=2.7mm, L=100mm, AO Connector Screwdriver, WS 2.5, self-holding sleeve	CARRIAGA RADA RADA CONTRACTOR CON	
37422-XX-N 6I253-IIO 56252	Spiral Drill, D=2.5mm, L=II0mm, AO Connector Screwdriver, WS 2.5, self-holding sleeve	Ottobble	

Screws Straight Locking Plate 3.5/4.5mm

37455-XX	Cortical Screw, locking, D=4.5mm	
61323-145	Spiral Drill, D=3.2mm, L=145mm, AO Connector	Callery
56352-SH	Screwdriver, WS 3.5, conic, self-holding	
32455-XX	Cortical Screw, D=4.5mm	
61323-145	Spiral Drill, D=3.2mm, L=145mm, AO Connector	Allege en .
56352-SH	Screwdriver, WS 3.5, conic, self-holding	400000
37592-XX	Cancellous Screw, locking, D=5.9mm	
61353-110	Spiral Drill, D=3.5mm, L=II0mm, AO Connector	Constitution of the second
56352-SH	Screwdriver, WS 3.5, conic, self-holding	
3059I-XX	Cancellous Screw, D=5.9mm	
61353-110	Spiral Drill, D=3.5mm, L=II0mm, AO Connector	Contract of the second
56352-SH	Screwdriver, WS 3.5, conic, self-holding	- Annual Marie



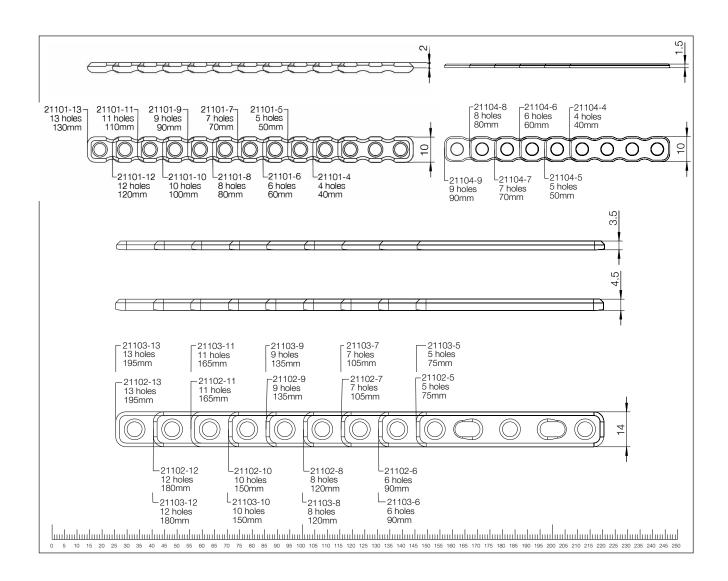
Properties

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
- Anatomical plate design
- Accurate fitting of the plate on the bone
- Plate lenghts, I.5mm: 4, 5, 6, 7, 8, 9-hole
- Plate lenghts, 2.0mm: 4, 5, 6, 7, 8, 9,
 II, I3-hole
- Plate lenghts, 3.5/4.5mm: 5, 6, 7, 8, 9,
 II, I2, I3-hole
- Straight Plate 3.5/4.5mm: Fracture gap compression up to 8mm



Time of operation

- Immediately after trauma or delayed
- After regression of swelling

Pre-operative patient preparation

- General anaesthesia, regional anaesthesia or combined can be used
- Tourniquet/partial deprivation of the blood supply

Exposure

- Intra-operative x-ray fluoroscopy observation is required during the entire procedure
- Incision to the limb subchondral bone fracture site
- Transection of musculature if possible along the course of muscle fibers

Surgical Technique



Straight Locking Plate 1.5mm

Indications:

- Comminuted fractures
- Supracondylar fractures
- Intra-articular and extra-articular condylar fractures
- Fractures in osteopenic bone
- Non-unions, mal-unions
- Fracture or osteotomy of the tibia, fibula, femoral condyle, acetabulum, humerus, ulna, middle hand and middle foot bones
- Treatment of calcaneal
- Hip arthrodesis

Contraindications:

All situations that do not allow osteosynthesis

Plate insertion

- Anatomical reduction of the fracture segments
- Temporary fixation of the plate using guide wires
- Subsequent control under fluoroscopy
- Optionally, the plate can be stabilized using the ITS. Temporary Plate Holder (58164-150)





Placement of the screws

Use the drill guide, D=2.7/2.0mm (62202) to bore with the spiral drill, D=2.7mm, L=100mm, AO Connector (61273-100) into the plate holes closest to the fracture.

Use the screwdriver, WS 2.5, self-holding sleeve (56252) to insert D=3.5mm cortical screws (32351-XX) of appropriate lengths determined previously with the depth gauge, solid small fragment screws (59022).

Attention: It is recommended that locking screws are not used close to the fracture.



Subsequently, place either D=3.5mm cortical or locking cortical screws (3235I-XX/3735I-XX-N) in plate holes far from the fracture.

Finally, control plate position under fluoroscopy.



Straight Locking Plate 2.0mm

Indications:

- Comminuted fractures
- Supracondylar fractures
- Intra-articular and extra-articular condylar fractures
- Fractures in osteopenic bone
- Non-unions, mal-unions
- Fracture or osteotomy of the tibia, fibula, femoral condyle, acetabulum, humerus, ulna, middle hand and middle foot bones
- Treatment of calcaneal
- Hip arthrodesis

Contraindications:

All situations that do not allow osteosynthesis

Plate insertion

- Anatomical reduction of the fracture segments
- Temporary fixation of the plate using guide wires
- Subsequent control under fluoroscopy
- Optionally, the plate can be stabilized using the ITS. Temporary Plate Holder (58164-150)





Placement of the screws

Use the drill guide, D=2.7/2.0mm (62202) to bore with the spiral drill, D=2.7mm, L=100mm, AO Connector (61273-100) into the plate holes closest to the fracture.

Use the screwdriver, WS 2.5, self-holding sleeve (56252) to insert D=3.5mm cortical screws (32351-XX) of appropriate lengths determined previously with the depth gauge, solid small fragment screws (59022).

Attention: It is recommended that locking screws are not used close to the fracture.



Subsequently, place either D=3.5mm cortical or locking cortical screws (3235I-XX/3735I-XX-N) in plate holes far from the fracture.

Finally, control plate position under fluoroscopy.



Straight Locking Plate 3.5/4.5mm

Indications:

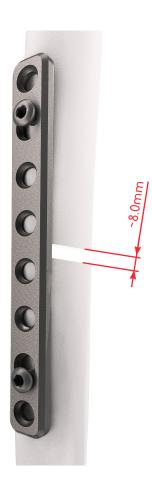
- Comminuted fractures
- Supracondylar fractures
- Intra-articular and extra-articular condylar fractures
- Fractures in osteopenic bone
- Non-unions, mal-unions
- Fracture or osteotomy of the tibia, fibula, femoral condyle, acetabulum, humerus, ulna, middle hand and middle foot bones
- Treatment of calcaneal
- Hip arthrodesis

Contraindications:

• All situations that do not allow osteosynthesis

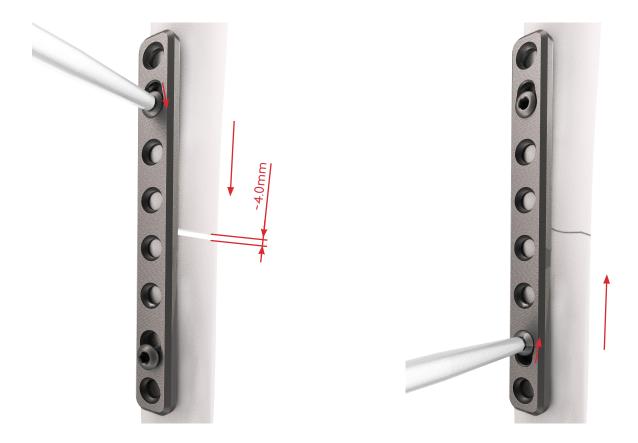
Plate insertion

- Anatomical reduction of the fracture parts
- Temporary fixation of the plate using forceps
- Subsequent control under fluoroscopy



Placement of the screws

For compression up to 8mm the D=4.5mm cortical screws or D=5.9mm cancellous screws (32455-XX/3059I-XX) are used at both sides of the fracture for compression.



Subsequently, place screws in the remaining plate holes.

Attention: It is recommended that locking screws are not used close to the fracture.

Finally, control plate position under fluoroscopy.



Postoperative treatment

- Drainage is recommended for 12-24 hours to prevent postoperative hematoma
- Proper bandage dressing for 2 weeks (until the wound heals)
- Physical therapy for 5-7 weeks
- When a locking screw connection has been used, it is necessary to be aware that a diagnosis of non-union may be very delayed

Explantation

If desired by the patient, the implant can be removed. Removal should be performed at the earliest 6 months - 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 17).

Information



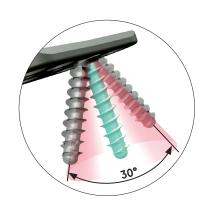
Locking

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:

- ± 15° and Locking
- No pre threading
- No cold welding
- No debris
- You can re-set the screw up to 3 times



Anodization Type II

Chemical process - anodization in a strong alkaline solution*

Type III anodization

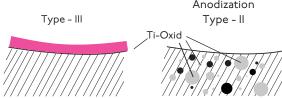
- Layer thickness 60-200nm
 - + Different colors

Discoloration

- Implant surface remains sensitive to: Chipping Peeling

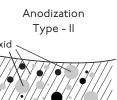
Type II anodization

- Layer thickness 1000-2000nm
 - + 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, Straight Locking Plate 1.5/2.0mm

Straight Plate, 1.5mm, 4-hole	21104-4	
Straight Plate, 1.5mm, 5-hole	21104-5	
Straight Plate, 1.5mm, 6-hole	21104-6	
Straight Plate, 1.5mm, 7-hole	21104-7	
Straight Plate, 1.5mm, 8-hole	21104-8	
Straight Plate, 1.5mm, 9-hole	21104-9	
Straight Plate, 2.0mm, 4-hole	21101-4	
Straight Plate, 2.0mm, 5-hole	21101-5	
Straight Plate, 2.0mm, 6-hole	21101-6	
Straight Plate, 2.0mm, 7-hole	21101-7	
Straight Plate, 2.0mm, 8-hole	21101-8	
Straight Plate, 2.0mm, 9-hole	21101-9	
Straight Plate, 2.0mm, 11-hole	21101-11	
Straight Plate, 2.0mm, 13-hole	21101-13	
Instruments and Screws, Straight Plate 1.5/2.0mm		
Cortical Screw, D=3.5mm, L=10mm	32351-10	
Cortical Screw, D=3.5mm, L=12mm	32351-10	Consession
Cortical Screw, D=3.5mm, L=12mm	32351-12	
Cortical Screw, D=3.5mm, L=14mm	32351-14	
Cortical Screw, D=3.5mm, L=18mm	32351-18	
Cortical Screw, D=3.5mm, L=20mm	32351-10	
Cortical Screw, D=3.5mm, L=22mm	32351-20	
Cortical Screw, D=3.5mm, L=24mm	32351-22	
Cortical Screw, D=3.5mm, L=26mm	32351-24	
Cortical Screw, D=3.5mm, L=28mm	32351-28	
Cortical Screw, D=3.5mm, L=30mm	32351-30	
Cortical Screw, D=3.5mm, L=32mm	32351-32	
Cortical Screw, D=3.5mm, L=34mm	32351-34	
Cortical Screw, D=3.5mm, L=36mm	32351-36	
Cortical Screw, D=3.5mm, L=38mm	32351-38	
Cortical Screw, D=3.5mm, L=40mm	32351-40	
Cortical Screw, D=3.5mm, L=42mm	32351-42	
Cortical Screw, D=3.5mm, L=44mm	32351-44	
Cortical Screw, D=3.5mm, L=46mm	32351-46	
Cortical Screw, D=3.5mm, L=48mm	32351-48	
Cortical Screw, D=3.5mm, L=50mm	32351-50	
Cortical Screw, D=3.5mm, L=55mm	32351-55	
Cortical Screw, D=3.5mm, L=60mm	32351-60	
Cortical Screw Locking D=7.5mm L=12mm SH	37351-12-N	(Microson
Cortical Screw, Locking, D=3.5mm, L=12mm, SH Cortical Screw, Locking, D=3.5mm, L=14mm, SH	37351-12-N 37351-14-N	(WHITE AREA CONTROL OF THE PROPERTY OF THE PR
Cortical Screw, Locking, D=3.5mm, L=14mm, SH Cortical Screw, Locking, D=3.5mm, L=16mm, SH	37351-14-N 37351-16-N	
Cortical Screw, Locking, D=3.5mm, L=18mm, SH	37351-16-N 37351-18-N	
Cortical Screw, Locking, D=3.5mm, L=10mm, SH Cortical Screw, Locking, D=3.5mm, L=20mm, SH	37351-16-N 37351-20-N	
Cortical Screw, Locking, D=3.5mm, L=22mm, SH	37351-20-N 37351-22-N	
Cortical Screw, Locking, D=3.5mm, L=24mm, SH	37351-22-N 37351-24-N	
Cortical Screw, Locking, D=3.5mm, L=24mm, SH	37351-24-N 37351-26-N	
Cortical Screw, Locking, D=3.5mm, L=28mm, SH	37351-26-N 37351-28-N	
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37351-32-N 37351-34-N 37351-36-N 37351-38-N 37351-40-N 37422-14-N 37422-16-N
37351-36-N 37351-38-N 37351-40-N
37351-38-N 37351-40-N
37351-40-N
37422-14-N
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37422-18-N
37422-10-N
37422-20-N 37422-22-N
37422-24-N
37422-24-IN 37422-26-N
37422-28-N
37422-30-N
37422-32-N
37422-34-N
37422-36-N
37422-38-N
37422-40-N
37422-42-N
37422-44-N
37422-46-N
37422-48-N
37422-50-N
37422-55-N
37422-60-N
56252
61273-100
59022
62202
58164-150
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For detailed cleaning and sterilization instructions, please refer to package insert.

Order list, Straight Locking Plate 3.5/4.5mm

Straight Plate, 3.5mm, 5-hole	21102-5	
Straight Plate, 3.5mm, 6-hole	21102-6	
Straight Plate, 3.5mm, 7-hole	21102-7	
Straight Plate, 3.5mm, 8-hole	21102-8	
Straight Plate, 3.5mm, 9-hole	21102-9	
Straight Plate, 3.5mm, 10-hole	21102-10	
Straight Plate, 3.5mm, 11-hole	21102-11	
Straight Plate, 3.5mm, 12-hole	21102-12	
Straight Plate, 3.5mm, 13-hole	21102-13	
Straight Plate, 4.5mm, 5-hole	21103-5	
Straight Plate, 4.5mm, 6-hole	21103-5	
Straight Plate, 4.5mm, 7-hole	21103-7	
Straight Plate, 4.5mm, 8-hole	21103-8	
Straight Plate, 4.5mm, 9-hole	21103-9	
Straight Plate, 4.5mm, 10-hole	21103-10	
Straight Plate, 4.5mm, 11-hole	21103-11	
Straight Plate, 4.5mm, 12-hole	21103-12	
Straight Plate, 4.5mm, 13-hole	21103-13	
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Cortical Screw, D=4.5mm, L=16mm	32455-16 32455-20	- (1990aa
Cortical Screw, D=4.5mm, L=20mm Cortical Screw, D=4.5mm, L=24mm	32455-20 32455-24	Summer .
Cortical Screw, D=4.5mm, L=28mm	32455-28	
Cortical Screw, D=4.5mm, L=32mm	32455-32	
Cortical Screw, D=4.5mm, L=36mm	32455-36	
Cortical Screw, D=4.5mm, L=40mm	32455-40	
Cortical Screw, D=4.5mm, L=44mm	32455-44	
Cortical Screw, D=4.5mm, L=48mm	32455-48	
Cortical Screw, D=4.5mm, L=52mm	32455-52	
Cortical Screw, D=4.5mm, L=56mm	32455-56	
Cortical Screw, D=4.5mm, L=60mm	32455-60	
Cortical Screw, D=4.5mm, L=65mm	32455-65	
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, Locking, D=4.5mm, L=16mm	37455-16	
Cortical Screw, Locking, D=4.5mm, L=20mm	37455-20	
Cortical Screw, Locking, D=4.5mm, L=24mm	37455-24	
Cortical Screw, Locking, D=4.5mm, L=28mm	37455-28	
Cortical Screw, Locking, D=4.5mm, L=32mm	37455-32	
Cortical Screw, Locking, D=4.5mm, L=36mm	37455-36	
Cortical Screw, Locking, D=4.5mm, L=40mm	37455-40	
Cortical Screw, Locking, D=4.5mm, L=44mm	37455-44	
Cortical Screw, Locking, D=4.5mm, L=48mm	37455-48	
Cortical Screw, Locking, D=4.5mm, L=52mm	37455-52	
Cortical Screw, Locking, D=4.5mm, L=56mm	37455-56	
Cortical Screw, Locking, D=4.5mm, L=60mm	37455-60	
Cortical Screw, Locking, D=4.5mm, L=65mm	37455-65	
20		

Spiral Drill, D=3.2mm, L=145mm, AO Connector Spiral Drill, D=3.5mm, L=110mm, AO Connector	61323-145 61353-110	
Screwdriver, WS 3.5, Conic, Self-holding	56352-SH	
Cancellous Screw, D=5.9mm, L=52mm, Threaded Cancellous Screw, D=5.9mm, L=56mm, Threaded Cancellous Screw, D=5.9mm, L=60mm, Threaded Cancellous Screw, D=5.9mm, L=65mm, Threaded Cancellous Screw, D=5.9mm, L=70mm, Threaded Cancellous Screw, D=5.9mm, L=75mm, Threaded Cancellous Screw, D=5.9mm, L=80mm, Threaded Cancellous Screw, D=5.9mm, L=85mm, Threaded Cancellous Screw, D=5.9mm, L=90mm, Threaded Cancellous Screw, D=5.9mm, L=90mm, Threaded	30591-52 30591-56 30591-60 30591-65 30591-70 30591-75 30591-80 30591-85 30591-90	
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=48mm, Threaded	30591-20 30591-24 30591-28 30591-32 30591-36 30591-40 30591-44	
Cancellous Screw, Locking, D=5.9mm, L=56mm Cancellous Screw, Locking, D=5.9mm, L=60mm Cancellous Screw, Locking, D=5.9mm, L=65mm Cancellous Screw, Locking, D=5.9mm, L=70mm Cancellous Screw, Locking, D=5.9mm, L=75mm Cancellous Screw, Locking, D=5.9mm, L=80mm Cancellous Screw, Locking, D=5.9mm, L=85mm Cancellous Screw, Locking, D=5.9mm, L=90mm Cancellous Screw, D=5.9mm, L=16mm, Threaded	37592-56 37592-60 37592-65 37592-70 37592-75 37592-80 37592-85 37592-90	
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 Cancellous Screw, Locking, D=5.9mm, L=52mm	37592-16 37592-20 37592-24 37592-28 37592-32 37592-36 37592-40 37592-44 37592-48 37592-52	
Cortical Screw, Locking, D=4.5mm, L=70mm Cortical Screw, Locking, D=4.5mm, L=75mm Cortical Screw, Locking, D=4.5mm, L=80mm Cortical Screw, Locking, D=4.5mm, L=85mm Cortical Screw, Locking, D=4.5mm, L=90mm	37455-70 37455-75 37455-80 37455-85 37455-90	

Depth Gauge, Solid Small Fragment Screws	59022	
Drill Guide, D=2.5/3.5mm	62252	
Sterilization Tray, Straight Plate 3.5/4.5mm	50223	
Optional (on request)*		
Cortical Screw, D=4.5mm, L=95mm Cortical Screw, D=4.5mm, L=100mm Cortical Screw, D=4.5mm, L=105mm Cortical Screw, D=4.5mm, L=110mm Cortical Screw, D=4.5mm, L=115mm Cortical Screw, D=4.5mm, L=120mm	32455-95 32455-100 32455-105 32455-110 32455-115 32455-120	
Cortical Screw, Locking, D=4.5mm, L=95mm Cortical Screw, Locking, D=4.5mm, L=100mm Cortical Screw, Locking, D=4.5mm, L=105mm Cortical Screw, Locking, D=4.5mm, L=110mm Cortical Screw, Locking, D=4.5mm, L=115mm Cortical Screw, Locking, D=4.5mm, L=120mm	37455-95 37455-100 37455-105 37455-110 37455-115 37455-120	
Cancellous Screw, Locking, D=5.9mm, L=95mm Cancellous Screw, Locking, D=5.9mm, L=100mm Cancellous Screw, Locking, D=5.9mm, L=105mm Cancellous Screw, Locking, D=5.9mm, L=110mm Cancellous Screw, Locking, D=5.9mm, L=115mm Cancellous Screw, Locking, D=5.9mm, L=120mm	37592-95 37592-100 37592-105 37592-110 37592-115 37592-120	
Cancellous Screw, D=5.9mm, L=95mm, Threaded Cancellous Screw, D=5.9mm, L=100mm, Threaded Cancellous Screw, D=5.9mm, L=105mm, Threaded Cancellous Screw, D=5.9mm, L=110mm, Threaded Cancellous Screw, D=5.9mm, L=115mm, Threaded Cancellous Screw, D=5.9mm, L=120mm, Threaded	30591-95 30591-100 30591-105 30591-110 30591-115	

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

Notes		



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