CT-F-001-0203 MFG:05/2011 REV:1

4CIS® SOLAR introduces you the reliable pedicle screw

SOLAR™

The Most Reliable Spinal Solution

Ergonomic design
Gentle to the spine

Threaded screw joint
Firm and secure fixation

Inner type head
Easy and quick operation

Dovetail thread
Secure fixation stability

SOLCO.
LIFE & SCIENCE

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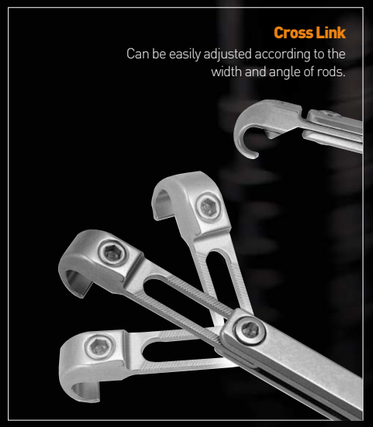
4CIS® SOLAR Spine System

The 4CIS® SOLAR Spine System is indicated for temporary or permanent correction and stabilization of the vertebral column from the thoracic to the sacrum with the aim of helping consolidation or bone fusion. It is designed for both posterior, sacral and anterior fixation.

Pedicle Screw
Various sizes of Screw(5.5, 6.5, 7.5mm in diameter) are available for perfect adaptation to the thoracic, lumber And sacral pedicles

Rod
Various 5.7mm per-ccut rods
Laser marked contour line.

Nut
Simplest of the locking mechansim.
By the result, it gets into shortening of operation time and minimum bleeding loss.



Cross Link
Can be easily adjusted according to the width and angle of rods.

Screw Thread
No self tapping to minimize any neural damage

Contents

Compact

4CIS®

Confident

Convenient

Comprehensive

SOLAR SPINE SYSTEM

Design Rationale

Progressive Changes

4CIS® SOLAR Spine System is an enhanced Poly-Axial Pedicle Screw System that provides the greatest holding power on the Poly-Axial Screw housing and the Solar set Screw, and allows stability of the spinal fixation system in surgical management of the spine.

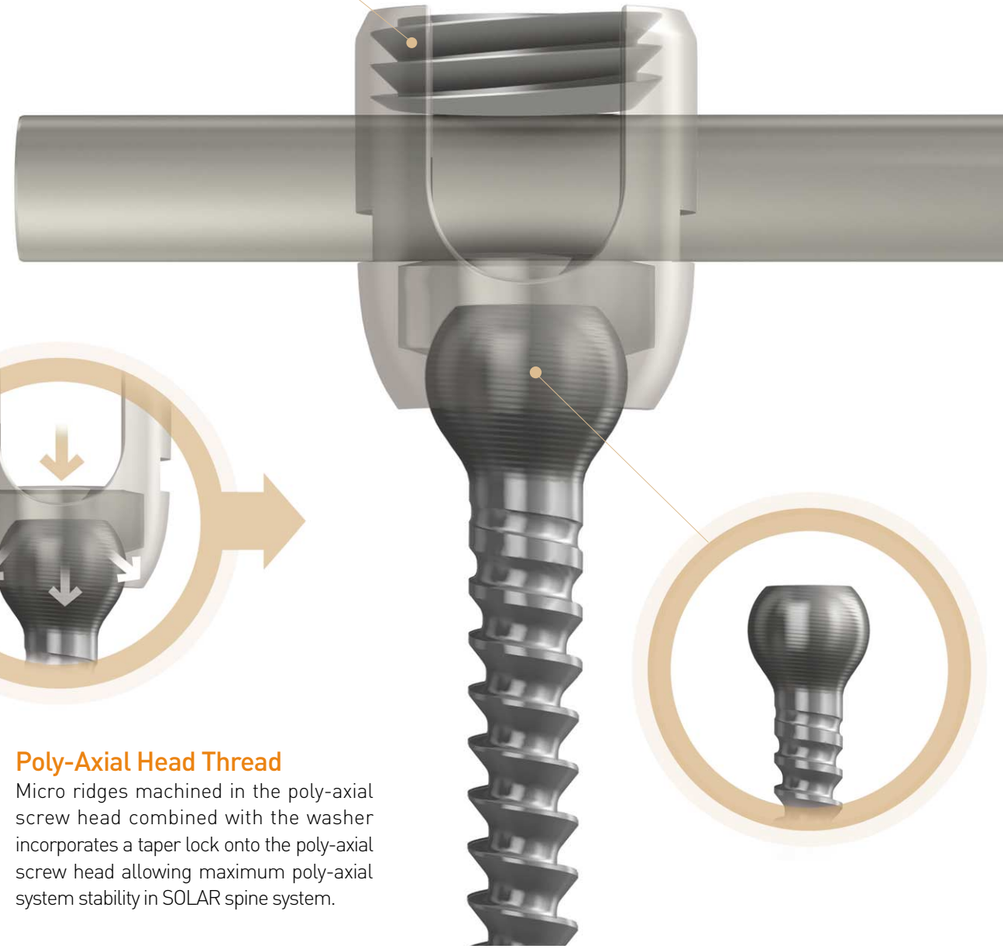
Enhanced Poly-axial System

- Superior locking performance
- Conic tapper housing increased stability
- Micro ridges on the poly-axial screw head and the washer allows maximum stability in Solar spine system.

SOLAR Pedicle Screw System

Poly-Axial Screw Head & Nut Thread

The design of SOLAR thread in the nut makes it possible to achieve firm and stable fixation between the Screw and the Nut (significantly increasing the compression strength).

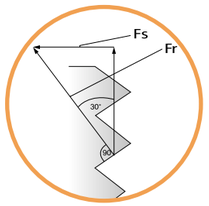


Poly-Axial Head Thread

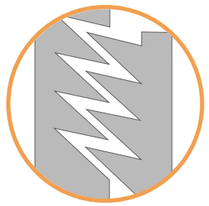
Micro ridges machined in the poly-axial screw head combined with the washer incorporates a taper lock onto the poly-axial screw head allowing maximum poly-axial system stability in SOLAR spine system.

SOLAR Pedicle Screw System

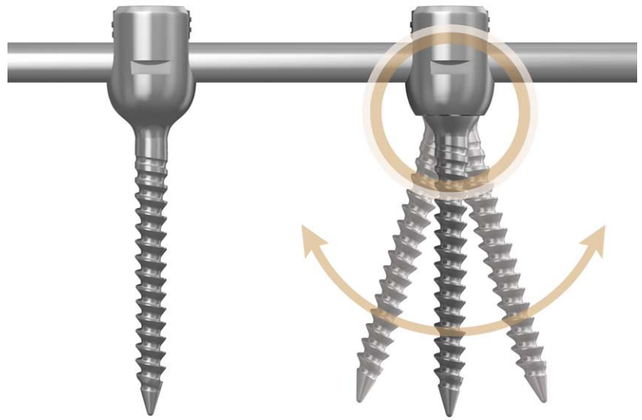
General thread design



SOLAR thread design

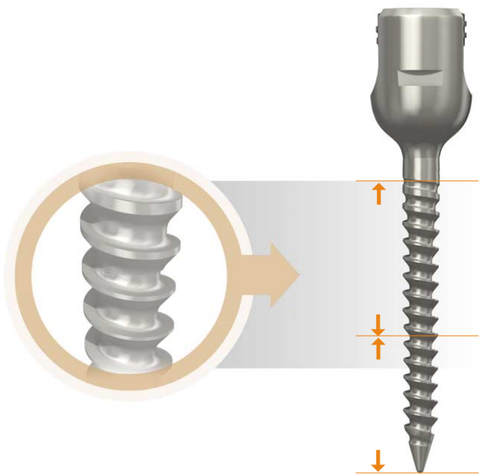


Thread Design	Area	Fs
Standard	0.61mm²	Fs=50% of Fr
SOLAR	0.66mm²	Fs=16% of Fr



Poly-Axial Pedicle Screw

Poly-Axial Pedicle Screw provides a variation of 30° in angle and ease of use while achieving best anatomic position.
Poly-Axial Screw has the same profile as mono-Axial Screw in shape, height and thickness.



Poly-Axial Screw Thread

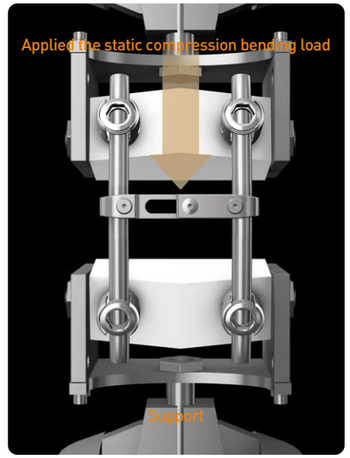
Various sizes of screws are available for perfect adaptation to the thoracic, lumbar and sacral pedicles.

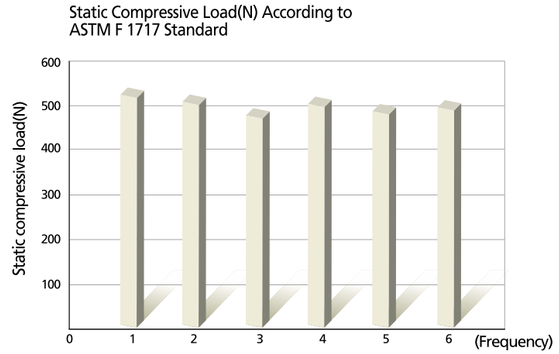
1/3 cylinder, 2/3 cylinder and Conical
- Optimal stress distribution
- Protection from screw pullout
- Easy insertion

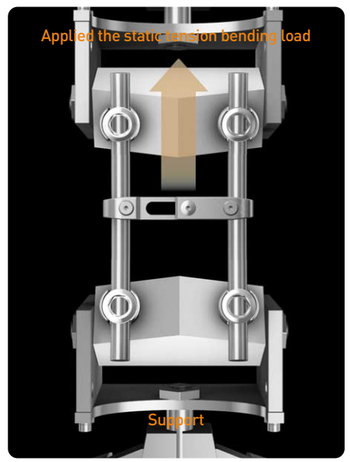
Non-self tapping to minimize any neural damage.

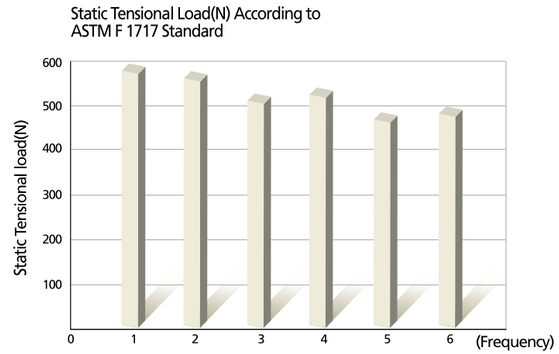
Mechanical Testing

The mechanical test including static and cyclic fatigue test was performed in accordance with **ASTM F1717.**



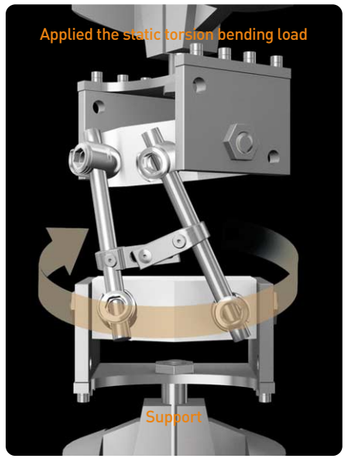


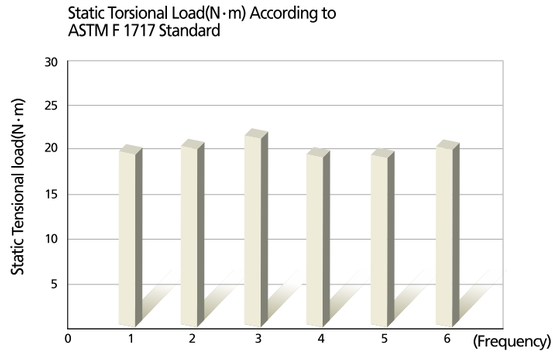


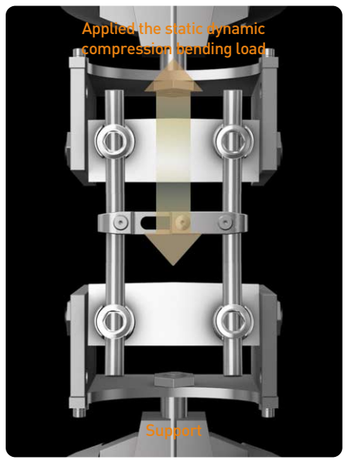


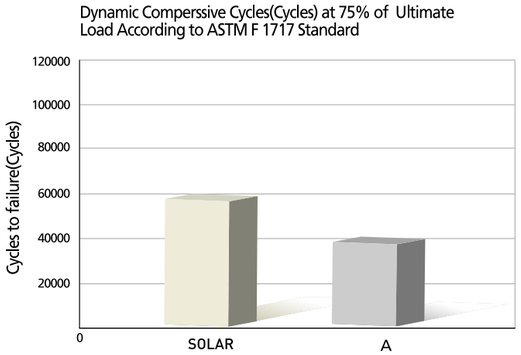
Mechanical Testing

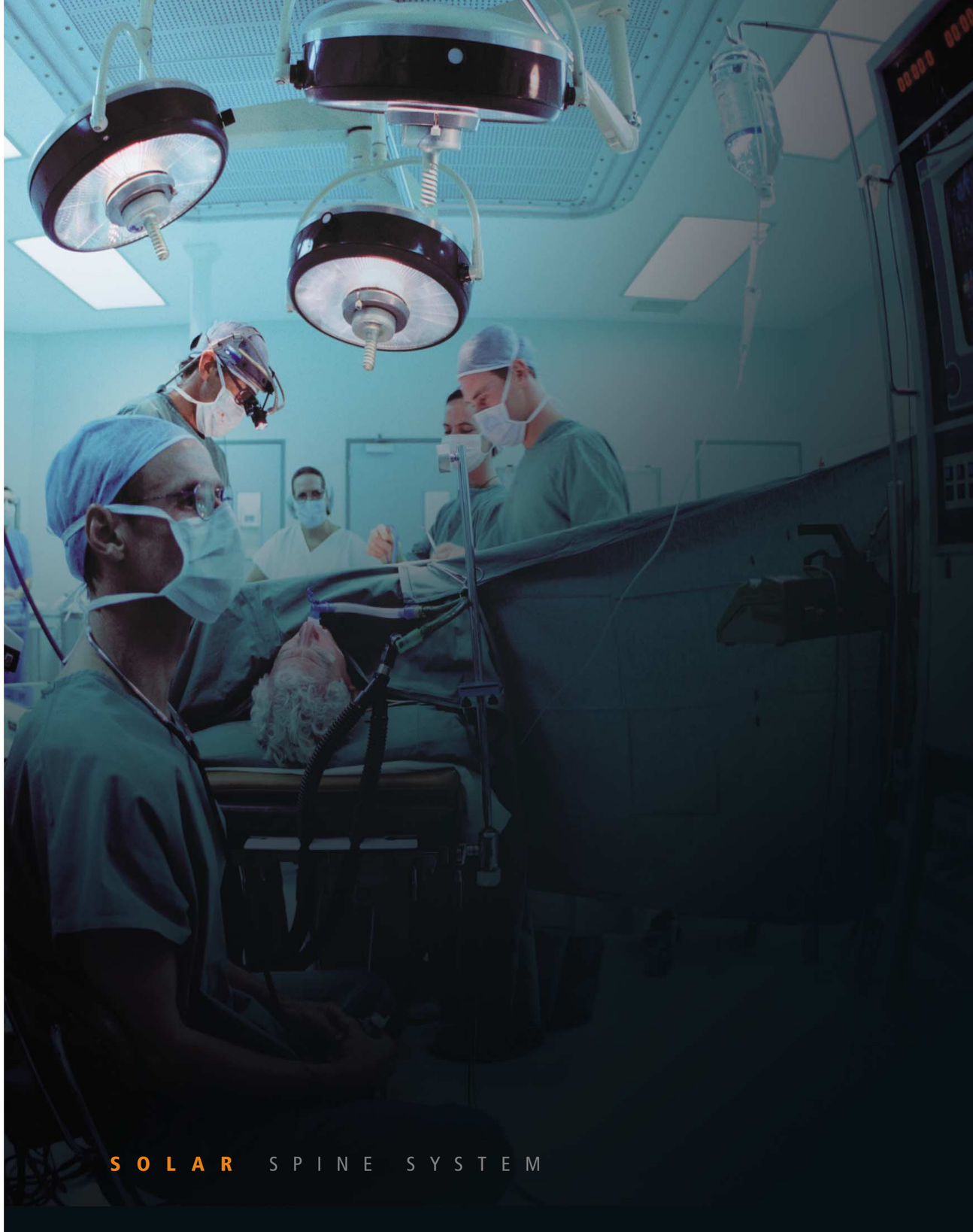
The mechanical test including static and cyclic fatigue test was performed in accordance with **ASTM F1717.**



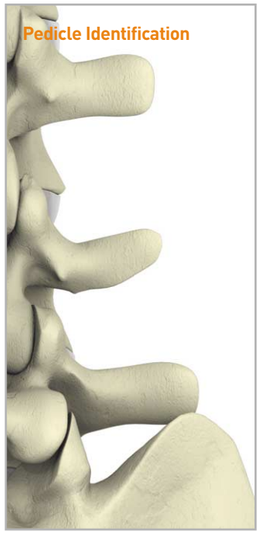


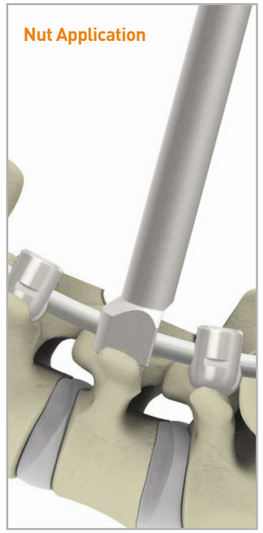


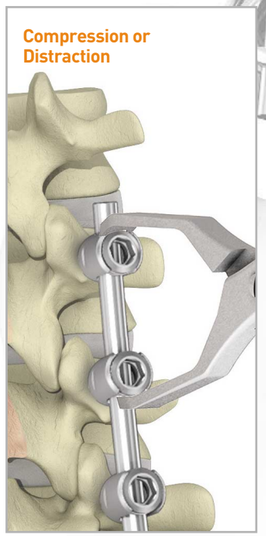




SOLAR Spine
Surgical Technique Manual





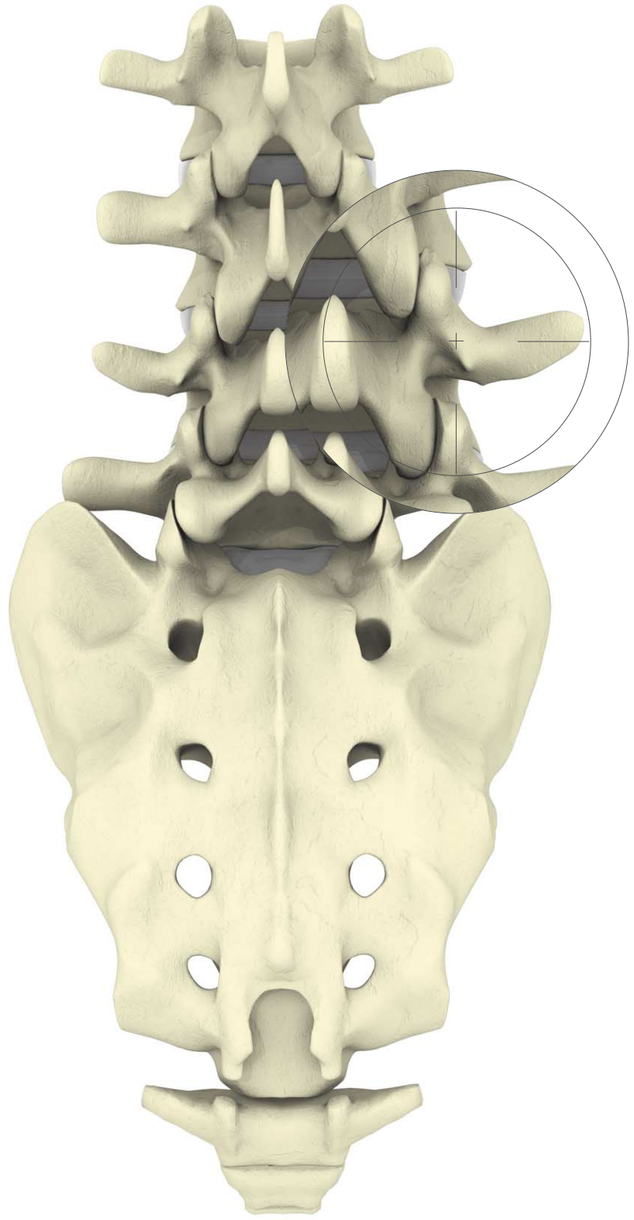


Surgical Technique Manual **Step 01 ~ Step 08**

Surgical Technique
Step 1

Pedicle Identification

The pedicle entry point depends on the intersection techniques. It involves drawing a line from the lateral aspect of the facet joint, which intersects a line that bisects the transverse process at a spot overlying the pedicle. However, because of the high variability in pedicle dimensions on each level of vertebra, intraoperative radiograph is checked to determine the exact position of the entry in the anteroposterior and lateral projection after inserting guide pins.

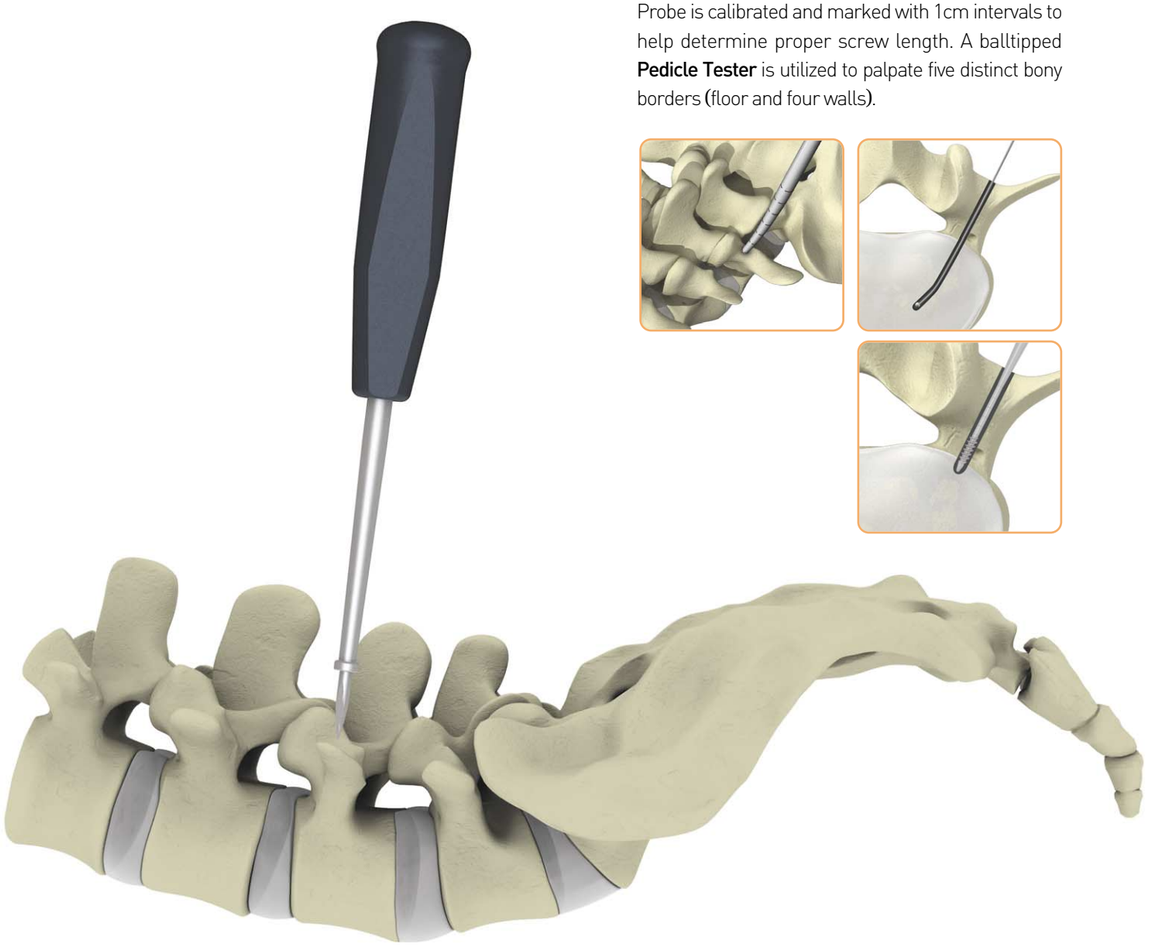


Surgical Technique Step 2

Pedicle Preparation

After the determination of the pedicle entry point, the entry hole is prepared by **Awl.**

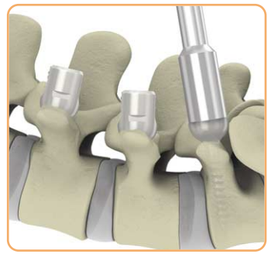
A pathway is then opened up with a **Pedicle Probe** from a smaller to a larger sequentially. The Pedicle Probe is calibrated and marked with 1cm intervals to help determine proper screw length. A balltipped **Pedicle Tester** is utilized to palpate five distinct bony borders (floor and four walls).

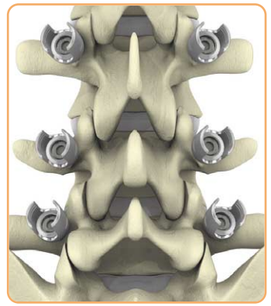


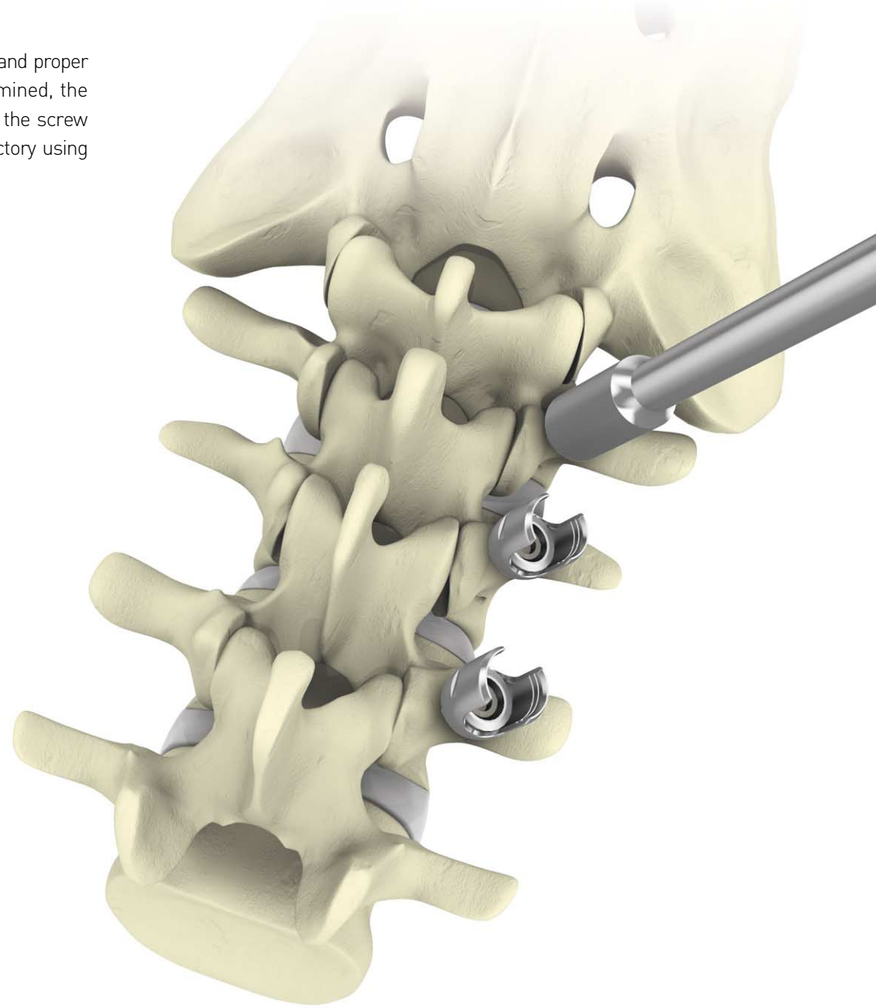
Surgical Technique Step 3

Screw Insertion

With the pedicle pathway prepared and proper screw length and diameter determined, the screw is ready for insertion. Place the screw slowly while checking proper trajectory using fluoroscopic x-ray.







Surgical Technique Step 4

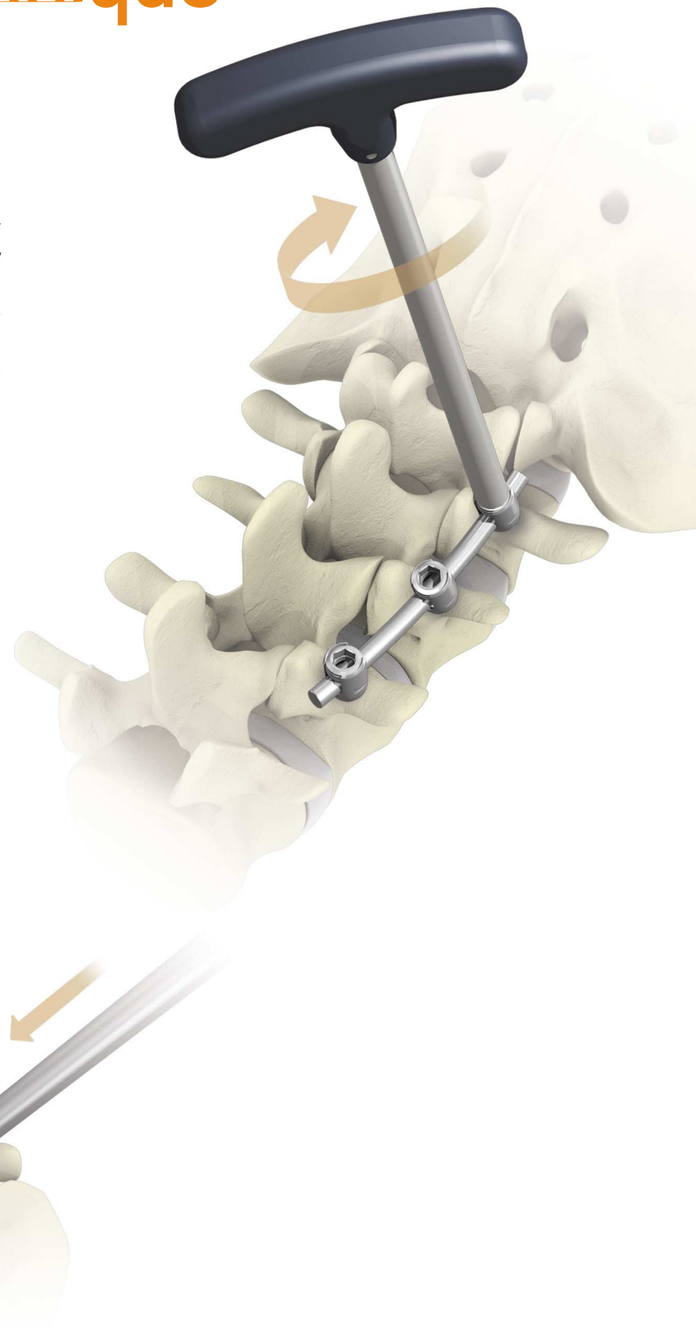
Rod Insertion

Cut the Rod to the appropriate length and bend the Rod with a **French Rod Bender** to fit the desired spinal contours .
A **Rod Holder** can be used for optimal Rod insertion.

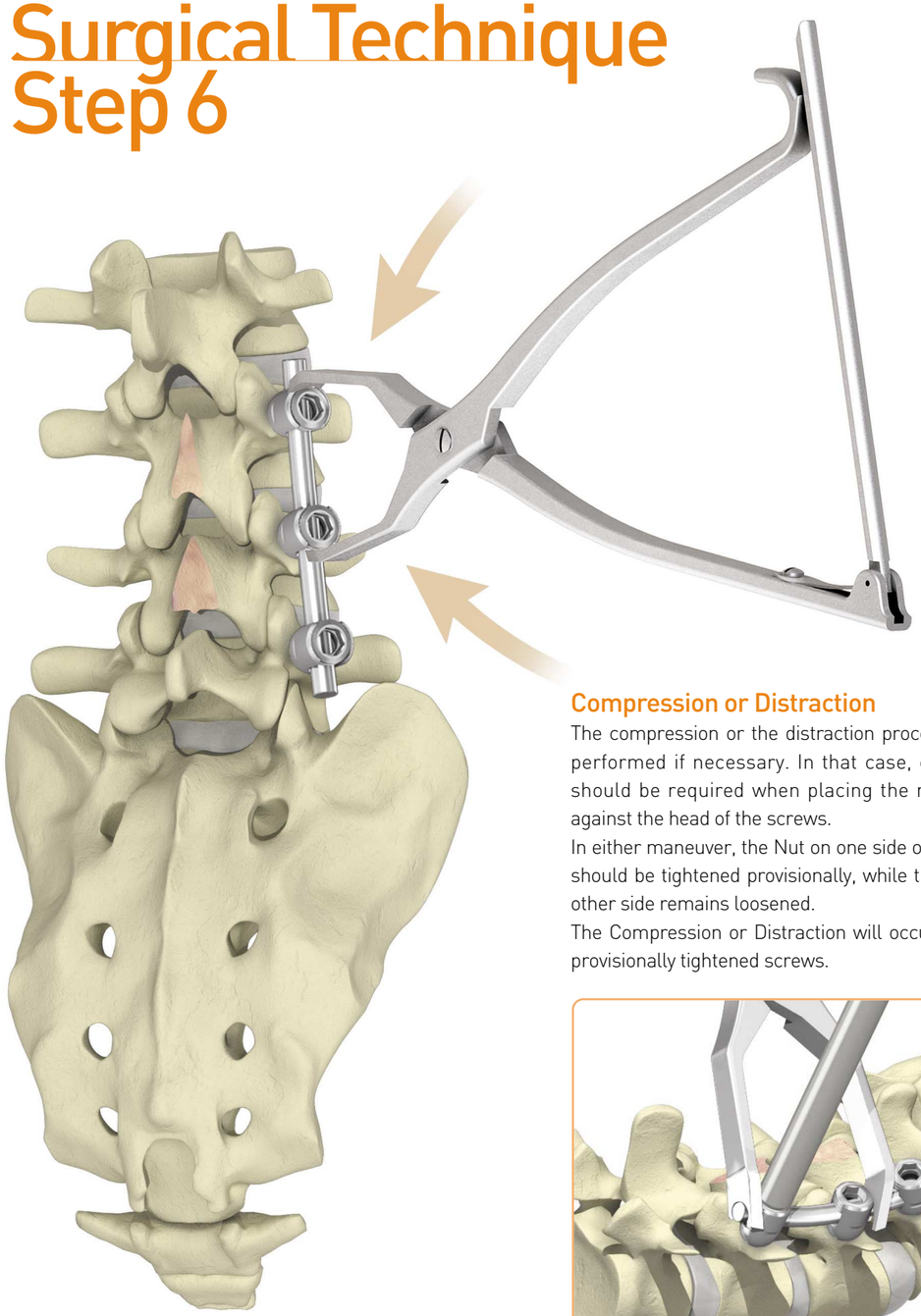
Surgical Technique Step 5

Nut Application

After the Rod is loaded into the bottom of the screw head, the Nut may be seated onto the top of the screw head using the **Nut Starter.**
When the rod is not fully seated into the head of the screw, the **Rod Introducer** is preferred for reduction. The Rod Introducer is then rotated clockwise levering the Rod inside of the screw head.
The Nut Starter is then used to insert the Nut.
If necessary, the **Rod Pusher** or **Anti Torque Wrench** is used to hold the Rod inside of screw head.



Surgical Technique Step 6



Compression or Distraction

The compression or the distraction procedure may be performed if necessary. In that case, extra caution should be required when placing the nuts securely against the head of the screws.

In either maneuver, the Nut on one side of the segment should be tightened provisionally, while the Nut on the other side remains loosened.

The Compression or Distraction will occur against the provisionally tightened screws.

Surgical Technique Step 7

Final Tightening

The final tightening is performed with the **Nut Final Driver** and the **Anti Torque Wench.**

The Anti Torque Wench is placed to a screw and a Rod, while the nut final Driver is inserted through the cannulation of the Anti Torque Wench.

If necessary, the Nut Final Driver may be used to remove a nut after final tightening.

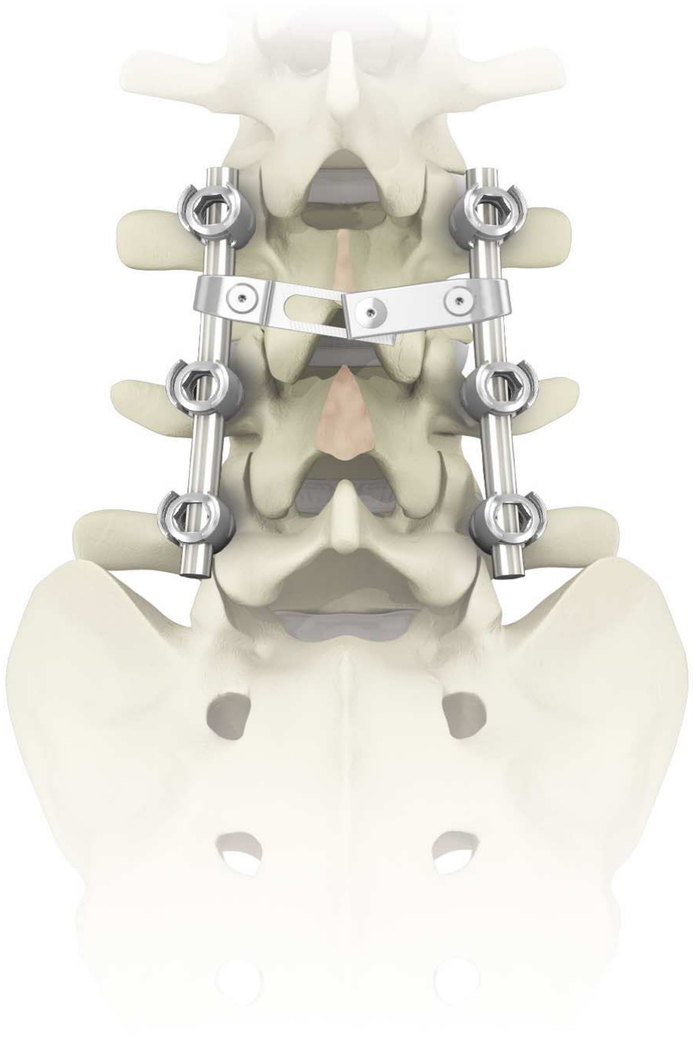
Once a nut has been removed, it should be discarded and replaced with the new one.

Surgical Technique
Step 8

Cross Link Technique

After selection of cross link that corresponds in proper size for the distance between rods, the cross link is applied to the rods and tightened with two tightening screws.

If the size of cross link doesn't fit exactly, **Compressor** or **Distractor** can be used accordingly to adjust the distance between rods before final fixation.



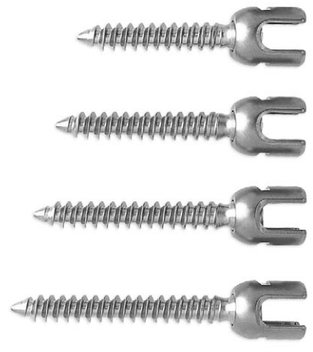
*The **4CIS**® **SOLAR Spine System** is a pedicle screw system indicated for the treatment of severe Spondylolisthesis (Grade 3 and 4) of the L5-S1 vertebra in skeletally mature patients receiving fusion by autogenous bone graft having implants attached to the lumbar and sacral spine (L3 to sacrum) with removal of the implants after the attainment of a solid fusion.*

Post OP X-ray

SOLAR Mono Axial Pedicle Screw

Cat. No	Size		Cat. No	Size		Cat. No	Size	
4162-4020	ø4.0	20mm	4162-5535	ø5.5	35mm	4162-7050	ø7.0	50mm
4162-4025	ø4.0	25mm	4162-5540	ø5.5	40mm	4162-7055	ø7.0	55mm
4162-4030	ø4.0	30mm	4162-5545	ø5.5	45mm	4162-7060	ø7.0	60mm
4162-4035	ø4.0	35mm	4162-5550	ø5.5	50mm	4162-7520	ø7.5	20mm
4162-4040	ø4.0	40mm	4162-5555	ø5.5	55mm	4162-7525	ø7.5	25mm
4162-4045	ø4.0	45mm	4162-5560	ø5.5	60mm	4162-7530	ø7.5	30mm
4162-4050	ø4.0	50mm	4162-6020	ø6.0	20mm	4162-7535	ø7.5	35mm
4162-4055	ø4.0	55mm	4162-6025	ø6.0	25mm	4162-7540	ø7.5	40mm
4162-4060	ø4.0	60mm	4162-6030	ø6.0	30mm	4162-7545	ø7.5	45mm
4162-4520	ø4.5	20mm	4162-6035	ø6.0	35mm	4162-7550	ø7.5	50mm
4162-4525	ø4.5	25mm	4162-6040	ø6.0	40mm	4162-7555	ø7.5	55mm
4162-4530	ø4.5	30mm	4162-6045	ø6.0	45mm	4162-7560	ø7.5	60mm
4162-4535	ø4.5	35mm	4162-6050	ø6.0	50mm	4162-8020	ø8.0	20mm
4162-4540	ø4.5	40mm	4162-6055	ø6.0	55mm	4162-8025	ø8.0	25mm
4162-4545	ø4.5	45mm	4162-6060	ø6.0	60mm	4162-8030	ø8.0	30mm
4162-4550	ø4.5	50mm	4162-6520	ø6.5	20mm	4162-8035	ø8.0	35mm
4162-4555	ø4.5	55mm	4162-6525	ø6.5	25mm	4162-8040	ø8.0	40mm
4162-4560	ø4.5	60mm	4162-6530	ø6.5	30mm	4162-8045	ø8.0	45mm
4162-5020	ø5.0	20mm	4162-6535	ø6.5	35mm	4162-8050	ø8.0	50mm
4162-5025	ø5.0	25mm	4162-6540	ø6.5	40mm	4162-8055	ø8.0	55mm
4162-5030	ø5.0	30mm	4162-6545	ø6.5	45mm	4162-8060	ø8.0	60mm
4162-5035	ø5.0	35mm	4162-6550	ø6.5	50mm	4162-8520	ø8.5	20mm
4162-5040	ø5.0	40mm	4162-6555	ø6.5	55mm	4162-8525	ø8.5	25mm
4162-5045	ø5.0	45mm	4162-6560	ø6.5	60mm	4162-8530	ø8.5	30mm
4162-5050	ø5.0	50mm	4162-7020	ø7.0	20mm	4162-8535	ø8.5	35mm
4162-5055	ø5.0	55mm	4162-7025	ø7.0	25mm	4162-8540	ø8.5	40mm
4162-5060	ø5.0	60mm	4162-7030	ø7.0	30mm	4162-8545	ø8.5	45mm
4162-5520	ø5.5	20mm	4162-7035	ø7.0	35mm	4162-8550	ø8.5	50mm
4162-5525	ø5.5	5mm	4162-7040	ø7.0	40mm	4162-8555	ø8.5	55mm
4162-5530	ø5.5	30mm	4162-7045	ø7.0	45mm	4162-8560	ø8.5	60mm

▶Some of the above items are not described on Screw Tray but available to be purchased



SOLAR Poly Axial Pedicle Screw

Cat. No	Size		Cat. No	Size		Cat. No	Size	
4172-4020	ø4.0	20mm	4172-5050	ø5.0	50mm	4172-6535	ø6.5	35mm
4172-4025	ø4.0	25mm	4172-5055	ø5.0	55mm	4172-6540	ø6.5	40mm
4172-4030	ø4.0	30mm	4172-5060	ø5.0	60mm	4172-6545	ø6.5	45mm
4172-4035	ø4.0	35mm	4172-5520	ø5.5	20mm	4172-6550	ø6.5	50mm
4172-4040	ø4.0	40mm	4172-5525	ø5.5	25mm	4172-6555	ø6.5	55mm
4172-4045	ø4.0	45mm	4172-5530	ø5.5	30mm	4172-6560	ø6.5	60mm
4172-4050	ø4.0	50mm	4172-5535	ø5.5	35mm	4172-7020	ø7.0	20mm
4172-4055	ø4.0	55mm	4172-5540	ø5.5	40mm	4172-7025	ø7.0	25mm
4172-4060	ø4.0	60mm	4172-5545	ø5.5	45mm	4172-7030	ø7.0	30mm
4172-4520	ø4.5	20mm	4172-5550	ø5.5	50mm	4172-7035	ø7.0	35mm
4172-4525	ø4.5	25mm	4172-5555	ø5.5	55mm	4172-7040	ø7.0	40mm
4172-4530	ø4.5	30mm	4172-5560	ø5.5	60mm	4172-7045	ø7.0	45mm
4172-4535	ø4.5	35mm	4172-6020	ø6.0	20mm	4172-7050	ø7.0	50mm
4172-4540	ø4.5	40mm	4172-6025	ø6.0	25mm	4172-7055	ø7.0	55mm
4172-4545	ø4.5	45mm	4172-6030	ø6.0	30mm	4172-7060	ø7.0	60mm
4172-4550	ø4.5	50mm	4172-6035	ø6.0	35mm	4172-7520	ø7.5	20mm
4172-4555	ø4.5	55mm	4172-6040	ø6.0	40mm	4172-7525	ø7.5	25mm
4172-4560	ø4.5	60mm	4172-6045	ø6.0	45mm	4172-7530	ø7.5	30mm
4172-5020	ø5.0	20mm	4172-6050	ø6.0	50mm	4172-7535	ø7.5	35mm
4172-5025	ø5.0	25mm	4172-6055	ø6.0	55mm	4172-7540	ø7.5	40mm
4172-5030	ø5.0	30mm	4172-6060	ø6.0	60mm	4172-7545	ø7.5	45mm
4172-5035	ø5.0	35mm	4172-6520	ø6.5	20mm	4172-7550	ø7.5	50mm
4172-5040	ø5.0	40mm	4172-6525	ø6.5	25mm	4172-7555	ø7.5	55mm
4172-5045	ø5.0	45mm	4172-6530	ø6.5	30mm	4172-7560	ø7.5	60mm

▶Some of the above items are not described on Screw Tray but available to be purchased

▶The design of products can be amended without prior consent.

SOLAR Reduction Pedicle Screw

Cat. No	Size	
4165-5535	ø5.5	35mm
4165-5540	ø5.5	40mm
4165-6535	ø6.5	35mm
4165-6540	ø6.5	40mm
4165-6545	ø6.5	45mm
4165-7530	ø7.5	30mm
4165-7535	ø7.5	35mm
4165-7540	ø7.5	40mm
4165-7545	ø7.5	45mm

* There are more sizes available but the aboves

SOLAR Rigid Rod

Cat. No	Size		Cat. No	Size	
4302-5704	ø5.7	40mm	4302-5713	ø5.7	130mm
4302-5701	ø5.7	45mm	4302-5714	ø5.7	140mm
4302-5705	ø5.7	50mm	4302-5715	ø5.7	150mm
4302-5755	ø5.7	55mm	4302-5716	ø5.7	160mm
4302-5706	ø5.7	60mm	4302-5717	ø5.7	170mm
4302-5765	ø5.7	65mm	4302-5718	ø5.7	180mm
4302-5707	ø5.7	70mm	4302-5719	ø5.7	190mm
4302-5775	ø5.7	75mm	4302-5720	ø5.7	200mm
4302-5708	ø5.7	80mm	4302-5725	ø5.7	250mm
4302-5785	ø5.7	85mm	4302-5730	ø5.7	300mm
4302-5709	ø5.7	90mm	4302-5735	ø5.7	350mm
4302-5795	ø5.7	95mm	4302-5740	ø5.7	400mm
4302-5710	ø5.7	100mm	4302-5745	ø5.7	450mm
4302-5711	ø5.7	110mm	4302-5750	ø5.7	500mm
4302-5712	ø5.7	120mm			

* Some of the above items are not described on Accessary Case but available to be purchased

SOLAR Cross - Link

Cat. No	Size
4412-3034	30~34mm
4412-3442	34~42mm
4412-4053	40~53mm
4412-5070	50~70mm

SOLAR Nut

Cat. No	Size
4222-0001	9.9×4.8(A×H)

▶The design of products can be amended without prior consent.

Awl
Cat. No 4901-5036

Pedicle Probe for 5.5mm Screw, STR.
Cat. No 29-10012

Pedicle Probe for 6.5mm Screw, STR.
Cat. No 29-10013

Pedicle Probe for 6.5mm Screw, CVD.
Cat. No 4901-0041

Pedicle Tester, STR.
Cat. No 29-10014

Pedicle Tester, CVD.
Cat. No 4901-5004

Rod Pusher
Cat. No 29-10026

▶The design of products can be amended without prior consent.

Rod Introducer
Cat. No 29-10027

Cross Link Screw Driver
Cat. No 4901-0030

Guide Pin (Triangle)
Cat. No 29-10015

Guide Pin (Ellipse)
Cat. No 29-10016

Tap for 5.5mm
Coed No. 4901-5006

Tap for 6.5mm
Cat. No 4901-5007

Tap for 7.5mm
Cat. No 4901-5014

Nut Starter
Cat. No 4901-5037

Nut Final Driver
Cat. No 4901-5012

Poly Axial Bone Screw Final Driver
Cat. No 4901-5015

▶The design of products can be amended without prior consent.

Mono Axial Screw Driver
Cat. No 4901-5010

Poly Axial Screw Driver
Cat. No 4901-2019

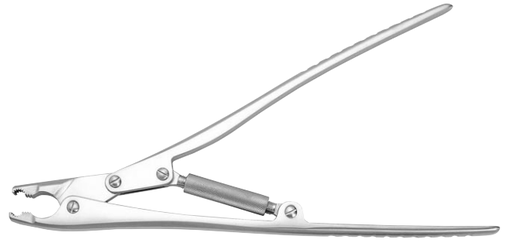
Torque Wrench (12N Torque Limiter)
Cat. No 4901-2012

In-line handle, square, Ratchet
Cat. No 4901-5034

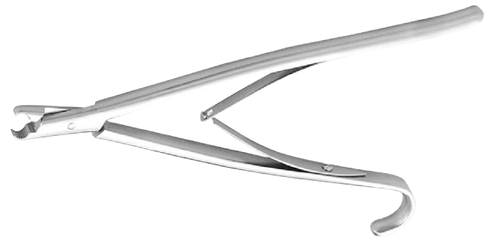
T-handle, square, Ratchet
Cat. No 4901-5035

French Rod Bender
Cat. No 29-10025

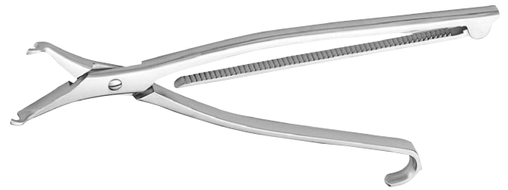
▶The design of products can be amended without prior consent.



Rod Gripper
Cat. No 29-10022

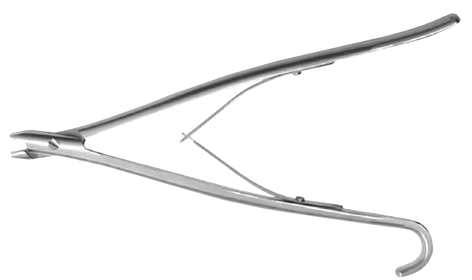


Rod Holder
Cat. No 4901-2009



Screw Compressor
Coed No. 29-10028

Screw Distractor
Cat. No 29-10029

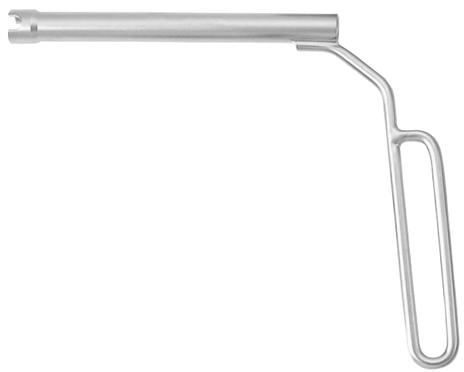


Reduction Cutter
Cat. No 29-10034

▶The design of products can be amended without prior consent.

Instruments

Anti Torque Wrench
Cat. No 29-10131



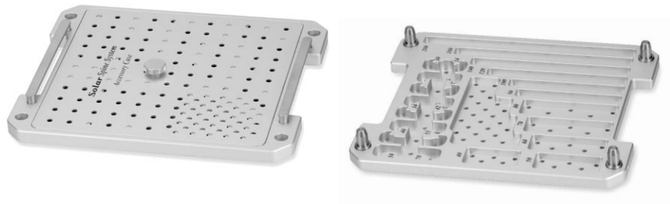
Nut Guide
Cat. No 4901-2008

Persuader
Cat. No 4901-5005

▶The design of products can be amended without prior consent.

Implants / Instruments Container

Screw Tray
Cat. No 9990-0404



Accessary Case
Cat. No 9990-0403

Implants Container
Cat. No 9990-0402

Instruments Container
Cat. No 9901-4019

▶The design of products can be amended without prior consent.