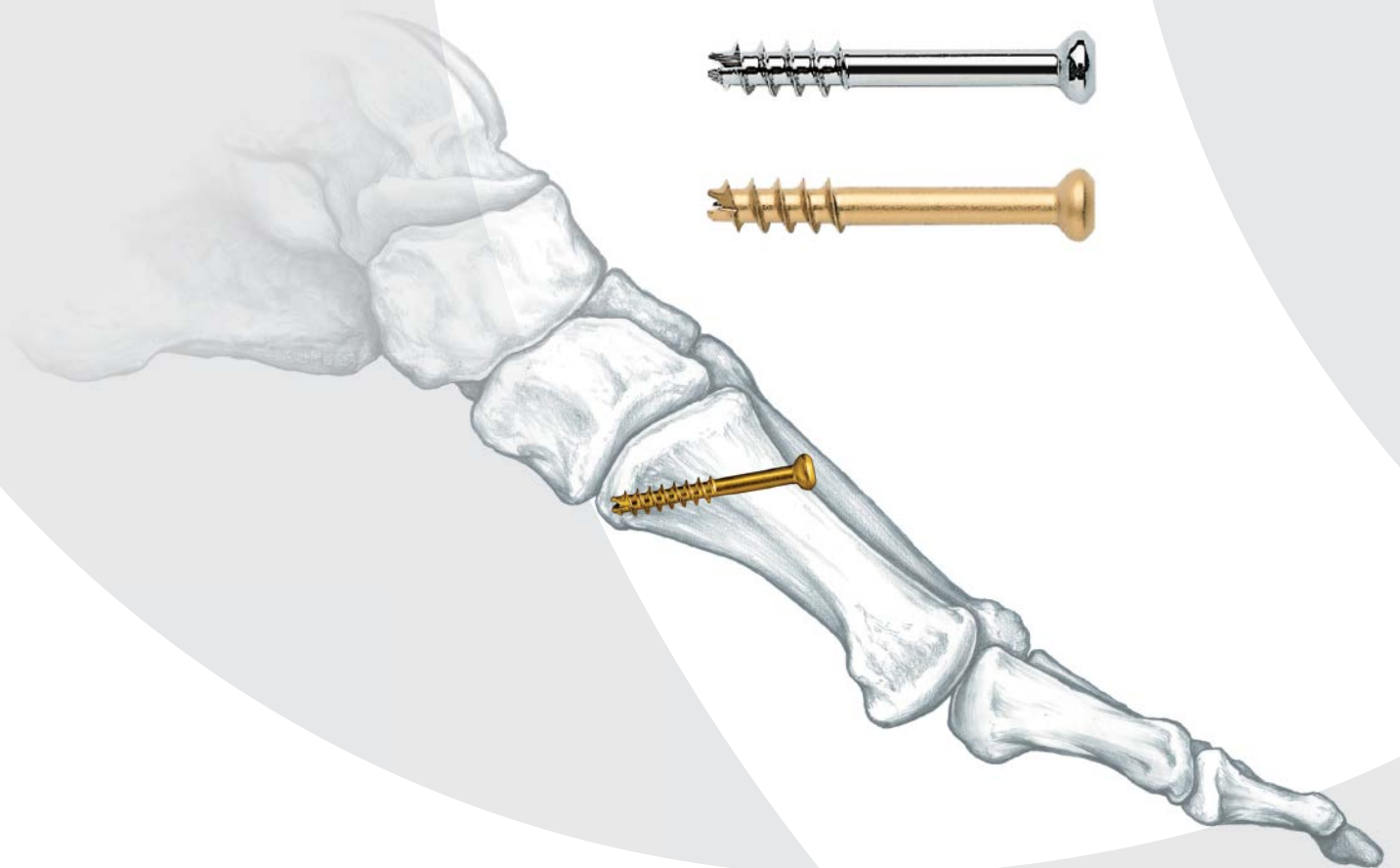


Part of the DePuy Synthes Cannulated Screw System

# 4.0 mm Cannulated Screws

Surgical Technique



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## MR Information

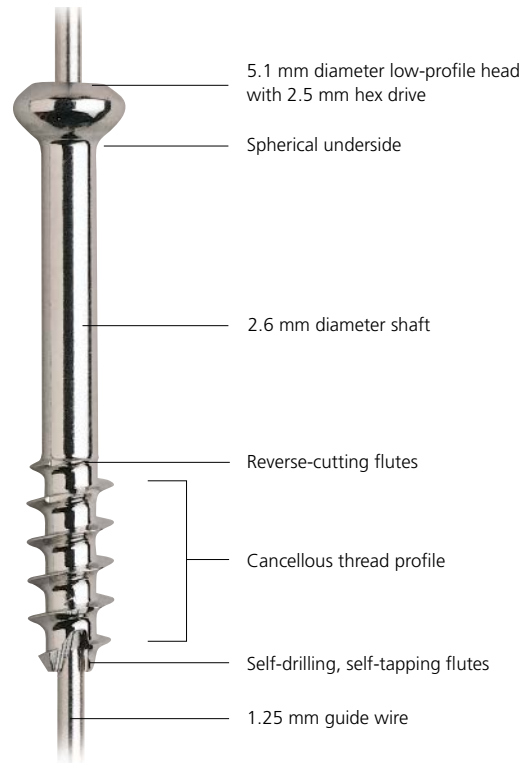
The 4.0 mm Cannulated Screw System has not been evaluated for safety and compatibility in the MR environment. It has not been tested for heating, migration or image artifact in the MR environment. The safety of the 4.0 mm Cannulated Screw System in the MR environment is unknown. Scanning a patient who has this device may result in patient injury.

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# 4.0 MM CANNULATED SCREWS

## Features

- Cannulated shaft accepts 1.25 mm diameter guide wires (threaded and nonthreaded wires available).
- Hemispherical head ensures optimal annular contact with washers and DePuy Synthes Companies plates when screws are angled.
- Low-profile head reduces possibility of soft tissue irritation.
- Standard 2.5 mm hexagonal drive is compatible with screwdrivers in other commonly used DePuy Synthes Sets.
- Reverse-cutting flutes assist in screw removal.
- Choice of thread lengths offers best fit of threads into far bone fragment, for greater interfragmentary compression.
- Cancellous thread profile uses deep cutting threads with a large pitch to increase resistance to pullout. The large pitch also accelerates screw insertion and removal.
- Self-drilling, self-tapping screw tip facilitates screw insertion by eliminating the need for predrilling and tapping in most cases.



## Thread lengths

Short thread

(thread length = 1/3 screw length)



Long thread

(thread length = 1/2 screw length)



# AO PRINCIPLES

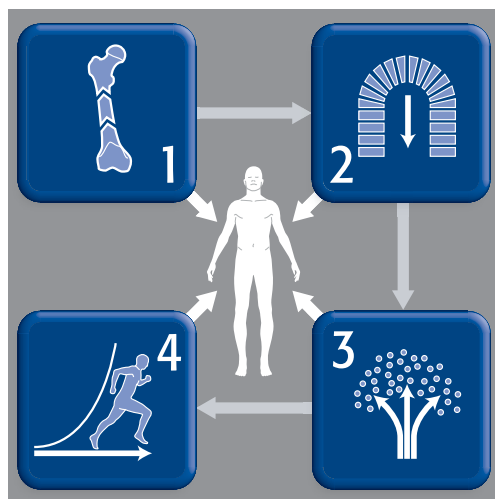
In 1958, the AO formulated four basic principles, which have become the guidelines for internal fixation.<sup>1,2</sup>

## Anatomic reduction

Fracture reduction and fixation to restore anatomical relationships.

## Early, active mobilization

Early and safe mobilization and rehabilitation of the injured part and the patient as a whole.



## Stable fixation

Fracture fixation providing absolute or relative stability, as required by the patient, the injury, and the personality of the fracture.

## Preservation of blood supply

Preservation of the blood supply to soft tissues and bone by gentle reduction techniques and careful handling.

1. Müller ME, Allgöwer M, Schneider R, Willenegger H. *Manual of Internal Fixation*. 3rd ed. Berlin, Heidelberg, New York: Springer-Verlag; 1991.  
2. Rüedi TP, RE Buckley, CG Moran. *AO Principles of Fracture Management*. 2nd ed. Stuttgart New York: Thieme; 2007.

# INDICATIONS

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For fracture fixation of small bones and small bone fragments.

**Warning:** This device is not approved for screw attachment or fixation to the posterior elements (pedicles) of the cervical, thoracic, or lumbar spine.

# PREPARATION

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## Required set

105.135	4.0 mm Cannulated Screw Instrument and Implant Set
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or

145.135	4.0 mm Titanium Cannulated Screw Instrument and Implant Set
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## Alternate sets

105.14	3.5 mm/4.0 mm Cannulated Screw Combined Instrument and Implant Set
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105.434	Small Fragment LCP Instrument and Implant Set
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or

145.434	Small Fragment LCP Instrument and Titanium Implant Set
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used with

105.436	Small Fragment LCP Instrument Set for Cannulated Screws and optional 4.0 mm Cannulated Screws
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## Cleaning cannulations

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### Instruments

319.25	1.35 mm Cleaning Brush
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319.38	1.25 mm Cleaning Stylet
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**Note:** Cleaning the cannulation in each instrument is imperative for proper function.

Instruments should be cleared intraoperatively with the cleaning stylet to prevent accumulation of debris in the cannulation and potential binding of the instruments about the guide wire. Instruments should be cleaned postoperatively with both the stylet and cleaning brush.

### Drilling and tapping

The self-drilling, self-tapping flutes of the 4.0 mm cannulated screw make predrilling and pretapping unnecessary in most cases. The sets include 2.7 mm cannulated drill bits and a cannulated tap for use in dense bone, if needed.

# SURGICAL TECHNIQUE

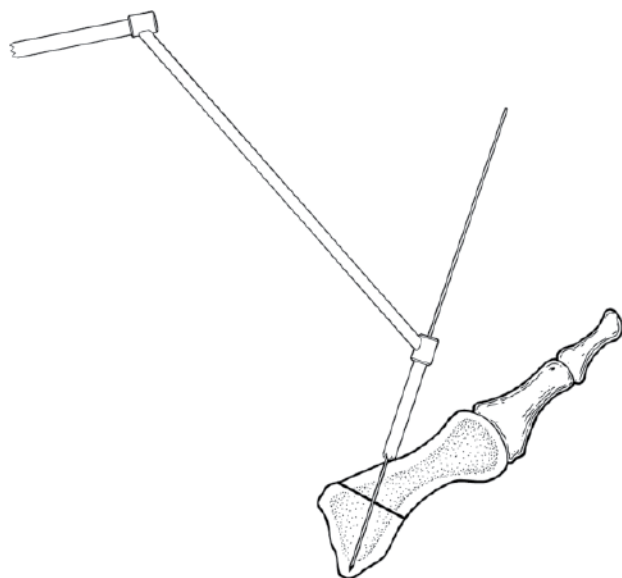
## 1

### Insert guide wire

#### Instruments

900.721	1.25 mm Non-Threaded Guide Wire
900.722	1.25 mm Threaded Guide Wire
312.35	2.7 mm/1.25 mm Double Drill Sleeve

- Insert a 1.25 mm guide wire through the 2.7 mm/1.25 mm double drill sleeve to the appropriate depth. Check placement of the wire under image intensification. Remove the drill sleeve.



## 2

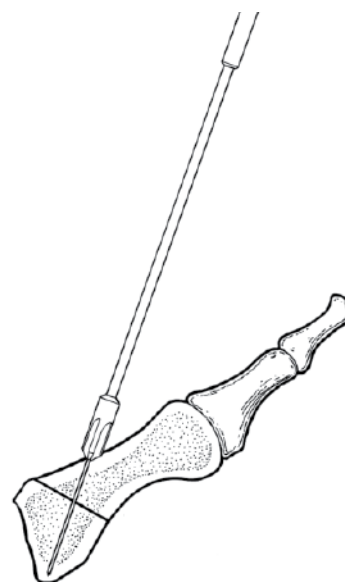
### Countersink (optional)

#### Instruments

310.86	Cannulated Countersink
311.43	Handle

In areas where soft tissue coverage is minimal, use the cannulated countersink to create a recess for the screw head. Countersinking will also facilitate screw insertion.

**Note:** If the countersink fails to bite, the near cortex can be predrilled using the cannulated drill bit.



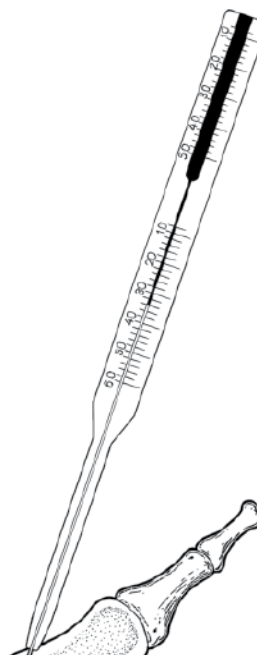
**3****Measure for screw length****Instrument**

319.15	Cannulated Screw Measuring Device
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Slide the tapered end of the cannulated screw measuring device over the guide wire, down to the bone. Read the scale at the end of the guide wire to determine appropriate screw length. This reading will place the screw 5 mm short of the tip of the guide wire, allowing the threaded portion of the guide wire to remain in the bone during screw insertion.

**Notes:**

- Only use the guide wire in its original length to ensure correct measurement.
- If the reading indicates 34 mm, use a 34 mm screw to place the screw 5 mm short of the wire tip.
- If countersinking, this should be done prior to measuring for screw length.

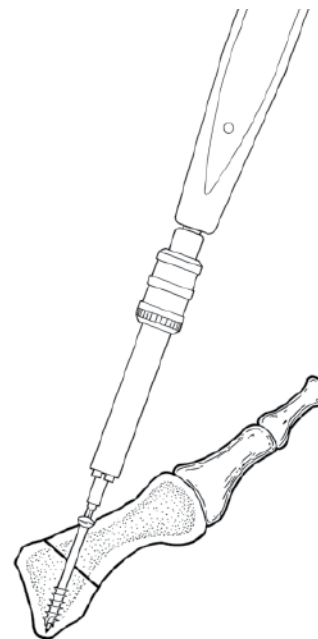
**4****Insert screw****Instruments**

310.67	2.7 mm Cannulated Drill Bit
314.08	Holding Sleeve
314.10	Cannulated Hexagonal Screwdriver Shaft
314.29	Cannulated Hexagonal Screwdriver

Place the appropriate length screw over the guide wire. Use the cannulated hexagonal screwdriver, or screwdriver shaft, and holding sleeve to insert the screw. Remove and discard the guide wire.

**Notes:**

- If using power to insert screws, use of the holding sleeve will reduce the risk of stripping the hex recess.
- In dense bone, it may be helpful to use a 2.7 mm cannulated drill bit to penetrate the near cortex prior to screw insertion.
- In osteoporotic bone, a washer may be used to prevent the screw head from sinking into the bone.





# IMPLANT REMOVAL

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## Instruments

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314.03	Small Hexagonal Screwdriver Shaft, 2.5 mm hex
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311.43	Handle
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Expose the screw head and remove the screws using the special screwdriver for the removal of cannulated screws.

**Precaution: Do not use the cannulated screwdriver for implant removal.**

# IMPLANTS IN THE 4.0 MM CANNULATED SCREW SYSTEM

## Stainless Steel and Titanium

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### 4.0 mm Cannulated Screws, short thread

- 10 mm–60 mm lengths in 2 mm increments
- 64 mm–72 mm lengths in 4 mm increments
- Thread length = 1/3 screw length
- 316L stainless steel
- Ti-6Al-7Nb titanium alloy



### 4.0 mm Cannulated Screws, long thread

- 16 mm–60 mm lengths in 2 mm increments
- 64 mm–72 mm lengths in 4 mm increments
- Thread length = 1/2 screw length
- 316L stainless steel
- Ti-6Al-7Nb titanium alloy



### Washer, 7.0 mm

- To prevent screw head from sinking into osteoporotic bone
- 316L stainless steel
- Commercially pure (CP) titanium



# INSTRUMENTS

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900.721 1.25 mm Non-Threaded Guide Wire, 150 mm



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900.722 1.25 mm Threaded Guide Wire, 150 mm  
Maintains reduction during drilling.  
Threaded spade point tip allows easy penetration into the bone and maximum resistance to inadvertent removal.



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310.67 2.7 mm Cannulated Drill Bit, 160 mm,  
1.35 mm cannulation, quick coupling



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310.86 Cannulated Countersink  
Cuts a recess for the screw head.  
Quick-connects to handle.



310.86

311.43

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311.63 Cannulated Tap for 4.0 mm Cannulated  
Screws  
Allows precise tapping in dense bone,  
when necessary. 147 mm, quick-connects  
to handle.



311.63

311.43

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312.35 2.7 mm/1.25 mm Double Drill Sleeve  
Protects soft tissue during guide wire  
placement and drilling.



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314.03 Small Hexagonal Screwdriver Shaft,  
2.5 mm hex  
Recommended for removal of 4.0 mm  
cannulated screws, connects to handle.



314.08	Holding Sleeve	
314.10	<p>Cannulated Hexagonal Screwdriver Shaft, 2.5 mm hex</p> <p>For power insertion of 4.0 mm cannulated screw over the guide wire. Accommodates holding sleeve.</p>	
314.29	<p>Cannulated Hexagonal Screwdriver, 2.5 mm hex</p> <p>Fully cannulated for insertion of any 4.0 mm cannulated screw over the guide wire. Accommodates holding sleeve.</p>	
319.15	<p>Cannulated Screw Measuring Device</p> <p>Provides a direct reading for screw length. Measurement places screw tip at thread/shaft junction of guide wire.</p>	
319.25	<p>1.35 mm Cleaning Brush</p> <p>For postoperative cleaning of 4.0 mm cannulated screw instruments.</p>	
319.38	<p>1.25 mm Cleaning Stylet</p> <p>For intraoperative cleaning of 4.0 mm cannulated screw instruments.</p>	
319.97	Screw Forceps	

# 4.0 MM CANNULATED SCREW INSTRUMENT AND IMPLANT SETS

Stainless Steel (105.135) and Titanium (145.135)

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## Graphic Case

690.495      Graphic Case, for 4.0 mm Cannulated Screw Instrument and Implant Set

Each set includes a graphic case that houses and organizes all of the set's implants and instruments in order to facilitate surgery, sterilization, and inventory control. The graphic case also provides space for some of the most common additionally available instruments and implants.

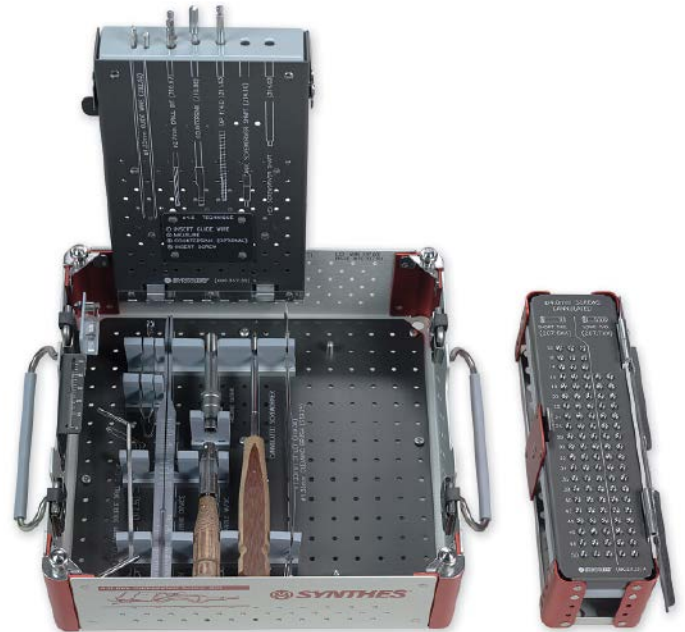
Screw rack is removable to enable separate sterilization of implants, and replacement can be ordered separately (690.496) or as part of the graphic case.

## Washers

219.98      Washer, 6 ea. (in set 105.135)  
419.98      Titanium Washer, 6 ea. (in set 145.135)

## Instruments

900.721      1.25 mm Non-Threaded Guide Wire, 150 mm, 10 ea.  
900.722      1.25 mm Threaded Guide Wire, 150 mm, 20 ea.  
310.67      2.7 mm Cannulated Drill Bit, 160 mm, 2 ea.  
310.86      Cannulated Countersink  
311.43      Handle, with quick coupling  
311.63      Cannulated Tap for 4.0 mm Cannulated Screws  
312.35      2.7 mm/1.25 mm Double Drill Sleeve  
314.03      Small Hexagonal Screwdriver Shaft, 2.5 mm hex  
314.08      Holding Sleeve  
314.10      Cannulated Hexagonal Screwdriver Shaft, 2.5 mm hex  
314.29      Cannulated Hexagonal Screwdriver, 2.5 mm hex  
319.15      Cannulated Screw Measuring Device  
319.25      1.35 mm Cleaning Brush  
319.38      1.25 mm Cleaning Stylet  
319.97      Screw Forceps



For detailed cleaning and sterilization instructions, please refer to [www.synthes.com/cleaning-sterilization](http://www.synthes.com/cleaning-sterilization) or sterilization instructions, if provided.

4.0 mm Cannulated Screw Instrument and Implant Sets  
Stainless Steel (105.135) and Titanium (145.135)

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**Implants**

4.0 mm Cannulated Screws, short thread, 3 ea.

Stainless

Steel	Titanium	Length (mm)
207.610	407.610	10
207.612	407.612	12
207.614	407.614	14
207.616	407.616	16
207.618	407.618	18
207.620	407.620	20
207.622	407.622	22
207.624	407.624	24
207.626	407.626	26
207.628	407.628	28
207.630	407.630	30
207.632	407.632	32
207.634	407.634	34
207.636	407.636	36
207.638	407.638	38
207.640	407.640	40
207.642	407.642	42
207.644	407.644	44
207.646	407.646	46
207.648	407.648	48
207.650	407.650	50

4.0 mm Cannulated Screw Instrument and Implant Sets  
Stainless Steel (105.135) and Titanium (145.135)

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**Also Available**

4.0 mm Cannulated Screws, short thread  
(thread length = 1/3 screw length)

Stainless Steel	Titanium	Length (mm)
207.652–	407.652–	52 mm – 60 mm,
207.660	407.660	2 mm increments
207.664–	407.664–	64 mm – 72 mm,
207.672	407.672	4 mm increments

4.0 mm Cannulated Screws, long thread  
(thread length = 1/2 screw length)

Stainless Steel	Titanium	Length (mm)
207.716–	407.716–	16 mm – 60 mm,
207.760	407.760	2 mm increments
207.764–	407.764–	64 mm – 72 mm,
207.772	407.772	4 mm increments

**Also Available for use with Alternate Sets**

**105.434 Small Fragment LCP Instrument/Implant Set  
and 145.434 Titanium Small Fragment LCP Instrument/  
Implant Set**

105.436	Small Fragment LCP Instrument Set for Cannulated Screws
690.383	Screw Rack, for Small Fragment LCP Set and 4.0 mm Cannulated Screws
690.412	Screw Rack, for Small Fragment LCP Set and 4.0 mm Titanium Cannulated Screws
207.610– 207.650	4.0 mm Cannulated Screws, short thread 10 mm–50 mm, 2 mm increments
407.610– 407.650	4.0 mm Titanium Cannulated Screws, short thread, 10 mm–50 mm, 2 mm increments

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