

90° Screwdriver

Intraoral and or a less invasive approach
for drilling and screw insertion

Surgical Technique





Image intensifier control

This description alone does not provide sufficient background for direct use of DePuy Synthes products. Instruction by a surgeon experienced in handling these products is highly recommended.

Processing, Reprocessing, Care and Maintenance

For general guidelines, function control and dismantling of multi-part instruments, as well as processing guidelines for implants, please contact your local sales representative or refer to:

<http://emea.depuysynthes.com/hcp/reprocessing-care-maintenance>

For general information about reprocessing, care and maintenance of DePuy Synthes reusable devices, instrument trays and cases, as well as processing of DePuy Synthes non-sterile implants, please consult the Important Information leaflet (SE_023827) or refer to:

<http://emea.depuysynthes.com/hcp/reprocessing-care-maintenance>

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90° Screwdriver

Intraoral and or a less invasive approach for drilling and screw insertion

Overview

The 90° screwdriver consists of a screwdriver handle, turning handle, shaft, a screw holder with screw holder inserts and a variety of attachments such as drill bits and screwdriver blades for manual and powered right-angled drilling and insertion of screws.

Screwdriver head

- Low profile screwdriver head height
- Drive design with gear ratio 2:1

Force transmission

- Drive shaft transmits the torque required for screw insertion

Drilling

- Suitable for right-angled drilling
- ISO standard intracoupling for connecting to an appropriate power source
- Facilitates exchange of drill bits and screwdriver blades



Range of applications as shown below:

Intraoral and or a less invasive approach for drilling and screw insertion

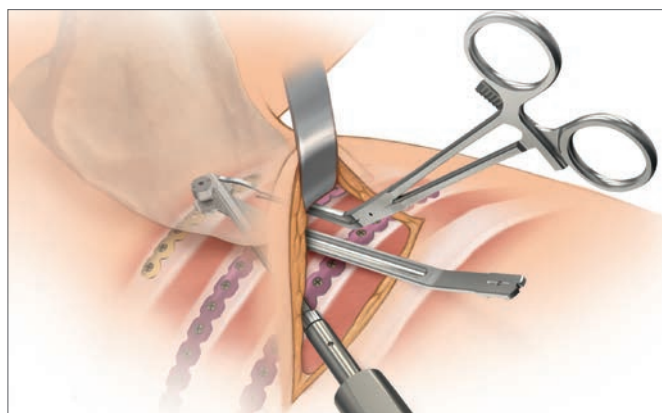
Examples – maxillofacial surgery

- Plate fixation of bilateral sagittal split osteotomies
- Endoscopically supported plate fixation of subcondylar fractures



Example – thoracic surgery

- Subscapula plate fixation for rib fracture treatment



Please refer to the corresponding Instructions for Use for specific information on Intended use, Indications, Contraindications, Warnings and Precautions, Potential Adverse Events, Undesirable Side Effect and Residual Risks. Instruction for Use are available at www.e-ifu.com and/or www.depuysynthes.com/ifu

Warnings

WARNINGS:

- These devices can break during use (when subjected to excessive forces or outside the recommended surgical technique). While the surgeon must make the final decision on removal of the broken part based on associated risk in doing so, we recommend that whenever possible and practical for the individual patient, the broken part should be removed.
- Medical devices containing stainless steel may elicit an allergic reaction in patients with hypersensitivity to nickel.
- To prevent injuries, ensure that the 90° screwdriver is not attached to power when inserting attachments.
- Universal precautions for handling contaminated/biohazardous materials should be observed.

Assembly

1. Insert gear

Insert the gear into the head of the shaft.



2. Assemble gear cover to the head of the shaft

Use the pins located on the turning handle to tighten the gear cover in place (must be done before the turning handle is assembled).



3. Insert the axle into the shaft

■ Note:

The shaft 03.505.003 comes preassembled (housing with gear, gear cover and axle).



4. Attach the screw holder

Attach the screw holder to the shaft end of the handle.
Optional: for maxillofacial surgery only.



5. Attach the shaft

Attach the shaft to the threaded end of the handle, press it down in the aligned position and screw the nut on the handle.



6. Attach the turning handle

Attach the turning handle or a power source to the handle.



Drilling

The 90° screwdriver handle has an ISO 3964/EN 23 964 standard intracoupling for connecting to an appropriate power source.

▲ Precaution:

The 90° screwdriver may only be used in combination with power sources which are compliant with the guidelines for medical devices.



1. Load a drill bit

Load a drill bit by pressing the head of the screwdriver onto the coupling end of the 90° screwdriver drill bit, with the drill bit held in place in the mini module. A distinctive click should be heard and/or felt in order to safely engage the drill bit to the shaft.

2. Remove the turning handle

Remove the turning handle from the screwdriver handle. Insert an appropriate powered drive unit with an intracoupling into the screwdriver handle. The powered drive unit must have an intracoupling in order to connect to the screwdriver handle.



3. Drill hole

▲ Precaution:

(for thoracic application only): Use the 2.2 mm MatrixRIB™ drill guide for 90° screwdriver to ensure perpendicular drilling for proper engagement of the locking screw in the plate.

▲ Precautions:

- Drill speed rate should never exceed 1,800 rpm, particularly in dense, hard bone. This corresponds to a maximum input speed of 3600 rpm (gear ratio of 2:1). Higher drill speed rates can result in:
 - thermal necrosis of the bone,
 - soft tissue burns,
 - an oversized hole, which can lead to reduced pullout force, increased ease of the screws stripping in bone, suboptimal fixation, and/or the need for emergency screws.
- Avoid damaging the plate threads with the drill.
- Always irrigate during drilling to avoid thermal damage to the bone.
- Irrigate and apply suction for removal of debris potentially generated during implantation or removal.
- Do not use force or bend the drill bit when drilling. This may damage the instrument and cause injury to the patient or user.
- Allow the device to cool for 2 minutes after drilling or before changing attachments. Improper use may cause the system to overheat and injure the patient or user.



Clinically relevant drill speed

Input Speed (set at power source)	Drill Speed
3600 RPM	1800 RPM

Theoretical maximum input speed to avoid the mechanical destruction of the screwdriver

Input Speed (set at power source)	Drill Speed
15000 RPM	7500 RPM

4. Remove the drill bit

To remove the drill bit, use the insert removal pin located on the module (or use the instrument for removal of inserts) by pressing the pin firmly through the hole in the gear cover.

▲ Precaution:

When removing the drill bit using the removal instrument, it is recommended to keep one hand over the drill bit as it “pops” up and may fall on the floor.



Screw Insertion

1. Load a screwdriver blade

Press the head of the screwdriver onto the coupling of the 90° screwdriver blade, with the blade held in place in a mini module.



2. Insert the screw

Manually turn the turning handle clockwise to insert the screw. To remove the screw, turn the turning handle counterclockwise. Gently rock the screwdriver head from side to side to release the screwdriver blade from the screw head.

▲ Precaution:

Do not use a power source for screw insertion because the high torque may result in screw stripping.

■ Note:

For mandible trauma and orthognathic surgery emergency screws are available in case of screws not engaging properly into the bone. Refer to MatrixMANDIBLE™ technique guide and MatrixORTHOGNATHIC™ technique guide.

3. Remove the screwdriver blade

To remove the 90° screwdriver blade, use the insert removal pin located on each module (or use the instrument for removal of inserts) by pressing the pin firmly through the hole in the gear cover.

▲ Precaution:

When removing the screwdriver blade using the removal instrument, it is recommended to keep one hand over the blade as it “pops” up and may fall on the floor.



Option

Screw holder for maxillofacial screw application

1. Attach screw holder insert

Attach the appropriate screw holder insert to the coupling on the screw holder.

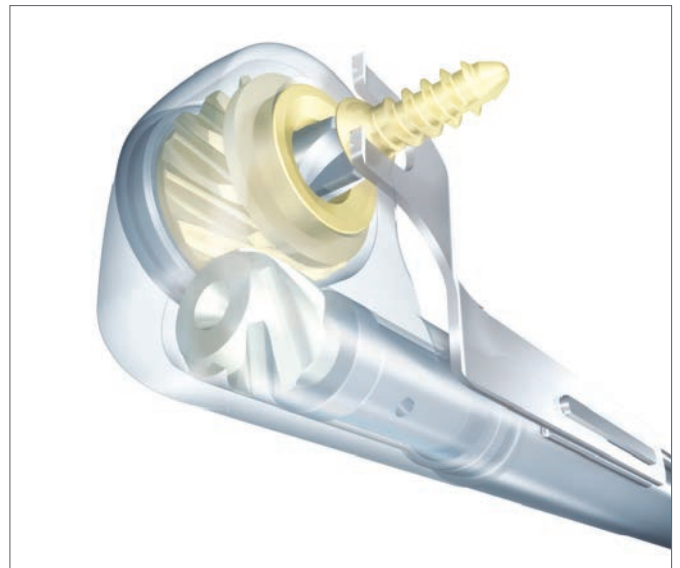


2. Secure the screw

Slide the screw holder forward so that the screw is held securely to the blade by the screw holder insert.

▲ Precautions:

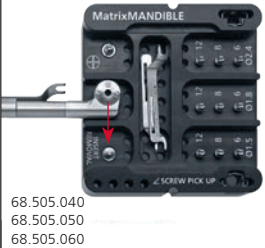
- After partial insertion of the screw, the screw holder needs to be pulled back before fully tightening the screw to allow the screw to be fully inserted.
- When the screw holder insert is not in use, it can be retracted and positioned behind the screwdriver head for better visibility of the operative site.



Disassembly



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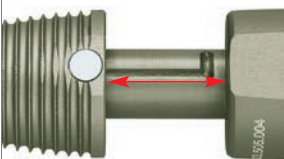
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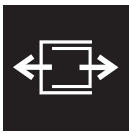


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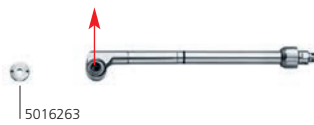




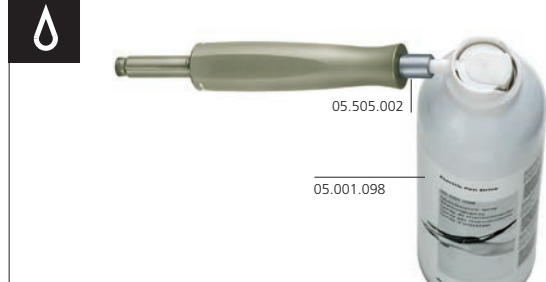
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Ordering Information

Set			
01.505.001	Screwdriver 90° Set	03.505.081	Drill Bit Ø 1.8 mm, with Stop, length 13/6 mm, 2-flute, for Screwdriver 90°
Cases		03.505.082	Drill Bit Ø 1.8 mm, with Stop, length 15/8 mm, 2-flute, for Screwdriver 90°
68.505.002	Instrument Tray for Screwdriver 90°	03.505.084	Drill Bit Ø 1.8 mm, with Stop, length 19/12 mm, 2-flute, for Screwdriver 90°
68.505.009	Lid for Instrument Tray, for Screwdriver 90°	03.505.091	Drill Bit Ø 2.4 mm, with Stop, length 13/6 mm, 2-flute, for Screwdriver 90°
68.505.040	MatrixMANDIBLE Mini Module for Instrument Tray, for Screwdriver 90°	03.505.092	Drill Bit Ø 2.4 mm, with Stop, length 15/8 mm, 2-flute, for Screwdriver 90°
68.505.060	MatrixORTHOGNATHIC Mini Module for Instrument Tray, for Screwdriver 90°	03.505.094	Drill Bit Ø 2.4 mm, with Stop, length 19/12 mm, 2-flute, for Screwdriver 90°
Instruments		Cases optional	
03.505.003	Shaft for Screwdriver 90°	68.505.050	MatrixMIDFACE™ Mini Module for Instrument Tray, for Screwdriver 90°
03.505.004	Handle for Screwdriver 90°	68.501.090	Module for MatrixRIB Instruments for 90° Screwdriver
03.505.005	Turning Handle for Screwdriver 90°	05.001.098	Synthes Maintenance Spray, 400 ml
03.505.010	Screwholder, without Insert, for Screwdriver 90°	05.505.002	Spray Adapter for Screwdriver 90°
03.505.011	Screwholder Insert for Screws Ø 1.5 and 2.0 mm, for Screwdriver 90°	Instruments optional	
03.505.012	Screwholder Insert for Screws Ø 2.4 mm, for Screwdriver 90°	05.505.003	Instrument for Removal of Inserts, for Screwdriver 90°
03.503.081	Screwdriver Shaft MatrixMANDIBLE, self- holding, for Screwdriver 90°	03.501.750	MatrixRIB Screwdriver Blade for 90° Screwdriver, self-retaining
03.503.083	Screwdriver Shaft MatrixMIDFACE™, self- holding, for Screwdriver 90°	03.501.751	2.2 mm MatrixRIB Drill Guide for 90° Screwdriver with 0–90°
03.505.141	Matrix Drill Bit Ø 1.4 mm, with Stop, length 13/6 mm, for Screwdriver 90°	03.501.752	2.2 mm MatrixRIB Drill Guide for 90° Screwdriver with 45–45°
03.505.144	Matrix Drill Bit Ø 1.4 mm, with Stop, length 15/8 mm, for Screwdriver 90°	05.001.103	Adaptor for Intra-Coupling for Pen Drive
03.505.147	Matrix Drill Bit Ø 1.4 mm, with Stop, length 19/12 mm, for Screwdriver 90°	03.505.035	Drill Bit Ø 1.1 mm, with Stop, length 11/4 mm, 2-flute, for Screwdriver 90°
03.505.075	Drill Bit Ø 1.5 mm, with Stop, length 13/6 mm, 2-flute, for Screwdriver 90°	03.505.036	Drill Bit Ø 1.1 mm, with Stop, length 13/6 mm, 2-flute, for Screwdriver 90°
03.505.076	Drill Bit Ø 1.5 mm, with Stop, length 15/8 mm, 2-flute, for Screwdriver 90°	03.505.037	Drill Bit Ø 1.1 mm, with Stop, length 15/8 mm, 2-flute, for Screwdriver 90°
03.505.078	Drill Bit Ø 1.5 mm, with Stop, length 19/12 mm, 2-flute, for Screwdriver 90°	03.505.026	Drill Bit Ø 1.25 mm, with Stop, length 17/10 mm, 2-flute, for Screwdriver 90°

		Available as sterile	
03.505.027	Drill Bit Ø 1.25 mm, with Stop, length 19/12 mm, 2-flute, for Screwdriver 90°	03.505.035S	Drill Bit Ø 1.1 mm, with Stop, length 11/4 mm, 2-flute, for Screwdriver 90°, sterile
03.505.085	Drill Bit Ø 1.8 mm, with Stop, length 21/14 mm, 2-flute, for Screwdriver 90°	03.505.036S	Drill Bit Ø 1.1 mm, with Stop, length 13/6 mm, 2-flute, for Screwdriver 90°, sterile
03.505.086	Drill Bit Ø 1.8 mm, with Stop, length 23/16 mm, 2-flute, for Screwdriver 90°	03.505.037S	Drill Bit Ø 1.1 mm, with Stop, length 15/8 mm, 2-flute, for Screwdriver 90°, sterile
03.505.087	Drill Bit Ø 1.8 mm, with Stop, length 25/18 mm, 2-flute, for Screwdriver 90°	03.505.026S	Drill Bit Ø 1.25 mm, with Stop, length 17/10 mm, 2-flute, for Screwdriver 90°, sterile
03.505.165	Matrix Drill Bit Ø 1.4 mm, with Stop, length 21/14 mm, for Screwdriver 90°	03.505.027S	Drill Bit Ø 1.25 mm, with Stop, length 19/12 mm, 2-flute, for Screwdriver 90°, sterile
03.505.166	Matrix Drill Bit Ø 1.4 mm, with Stop, length 23/16 mm, for Screwdriver 90°	03.505.141S	Matrix Drill Bit Ø 1.4 mm, with Stop, length 13/6 mm, for Screwdriver 90°, sterile
03.505.167	Matrix Drill Bit Ø 1.4 mm, with Stop, length 25/18 mm, for Screwdriver 90°	03.505.144S	Matrix Drill Bit Ø 1.4 mm, with Stop, length 15/8 mm, for Screwdriver 90°, sterile
03.501.756	MatrixRIB Drill Bit Ø 2.2 mm, with Stop, length 6 mm, 2-flute, for Screwdriver 90°	03.505.147S	Matrix Drill Bit Ø 1.4 mm, with Stop, length 19/12 mm, for Screwdriver 90°, sterile
03.501.758	MatrixRIB Drill Bit Ø 2.2 mm, with Stop, length 8 mm, 2-flute, for Screwdriver 90°	03.505.165S	Matrix Drill Bit Ø 1.4 mm, with Stop, length 21/14 mm, for Screwdriver 90°, sterile
03.501.760	MatrixRIB Drill Bit Ø 2.2 mm, with Stop, length 10 mm, 2-flute, for Screwdriver 90°	03.505.166S	Matrix Drill Bit Ø 1.4 mm, with Stop, length 23/16 mm, for Screwdriver 90°, sterile
03.501.762	MatrixRIB Drill Bit Ø 2.2 mm, with Stop, length 12 mm, 2-flute, for Screwdriver 90°	03.505.167S	Matrix Drill Bit Ø 1.4 mm, with Stop, length 25/18 mm, for Screwdriver 90°, sterile
03.501.764	MatrixRIB Drill Bit Ø 2.2 mm, with Stop, length 14 mm, 2-flute, for Screwdriver 90°		
03.501.766	MatrixRIB Drill Bit Ø 2.2 mm, with Stop, length 16 mm, 2-flute, for Screwdriver 90°		
03.501.768	MatrixRIB Drill Bit Ø 2.2 mm, with Stop, length 18 mm, 2-flute, for Screwdriver 90°		
03.501.770	MatrixRIB Drill Bit Ø 2.2 mm, with Stop, length 20 mm, 2-flute, for Screwdriver 90°		

Available as sterile

03.505.075S	Drill Bit Ø 1.5 mm, with Stop, length 13/6 mm, 2-flute, for Screwdriver 90°, sterile
03.505.076S	Drill Bit Ø 1.5 mm, with Stop, length 15/8 mm, 2-flute, for Screwdriver 90°, sterile
03.505.078S	Drill Bit Ø 1.5 mm, with Stop, length 19/12 mm, 2-flute, for Screwdriver 90°, sterile
03.505.081S	Drill Bit Ø 1.8 mm, with Stop, length 13/6 mm, 2-flute, for Screwdriver 90°, sterile
03.505.082S	Drill Bit Ø 1.8 mm, with Stop, length 15/8 mm, 2-flute, for Screwdriver 90°, sterile
03.505.084S	Drill Bit Ø 1.8 mm, with Stop, length 19/12 mm, 2-flute, for Screwdriver 90°, sterile
03.505.085S	Drill Bit Ø 1.8 mm, with Stop, length 21/14 mm, 2-flute, for Screwdriver 90°, sterile
03.505.086S	Drill Bit Ø 1.8 mm, with Stop, length 23/16 mm, 2-flute, for Screwdriver 90°, sterile
03.505.087S	Drill Bit Ø 1.8 mm, with Stop, length 25/18 mm, 2-flute, for Screwdriver 90°, sterile
03.505.091S	Drill Bit Ø 2.4 mm, with Stop, length 13/6 mm, 2-flute, for Screwdriver 90°, sterile
03.505.092S	Drill Bit Ø 2.4 mm, with Stop, length 15/8 mm, 2-flute, for Screwdriver 90°, sterile
03.505.094S	Drill Bit Ø 2.4 mm, with Stop, length 19/12 mm, 2-flute, for Screwdriver 90°, sterile
03.501.756S	MatrixRIB Drill Bit Ø 2.2 mm, with Stop, length 6 mm, 2-flute, for Screwdriver 90°, sterile
03.501.758S	MatrixRIB Drill Bit Ø 2.2 mm, with Stop, length 8 mm, 2-flute, for Screwdriver 90°, sterile

03.501.760S	MatrixRIB Drill Bit Ø 2.2 mm, with Stop, length 10 mm, 2-flute, for Screwdriver 90°, sterile
03.501.762S	MatrixRIB Drill Bit Ø 2.2 mm, with Stop, length 12 mm, 2-flute, for Screwdriver 90°, sterile
03.501.764S	MatrixRIB Drill Bit Ø 2.2 mm, with Stop, length 14 mm, 2-flute, for Screwdriver 90°, sterile
03.501.766S	MatrixRIB Drill Bit Ø 2.2 mm, with Stop, length 16 mm, 2-flute, for Screwdriver 90°, sterile
03.501.768S	MatrixRIB Drill Bit Ø 2.2 mm, with Stop, length 18 mm, 2-flute, for Screwdriver 90°, sterile
03.501.770S	MatrixRIB Drill Bit Ø 2.2 mm, with Stop, length 20 mm, 2-flute, for Screwdriver 90°, sterile
03.503.083S	Screwdriver Shaft MatrixMIDFACE™, self-holding, for Screwdriver 90°, sterile

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