



Angulus 2

Angled Screwdriver



Oral and maxillofacial surgery is our passion! We also want to continue our development along with our customers. Day in, day out, we work to develop innovative products and services that satisfy the highest quality demands and contribute to the patient's well-being.

Angulus 2 Angled Screwdriver

The angled screwdriver rounds off our product portfolio for transoral osteosynthesis in hard to reach regions of the jaw.

It is particularly well suited for osteosynthesis at the mandibular angle and ramus up to the condylar process.

Along with osteosynthesis plates and other instruments, especially developed for this indication, we provide complete one-stop solutions for this demanding anatomical region.

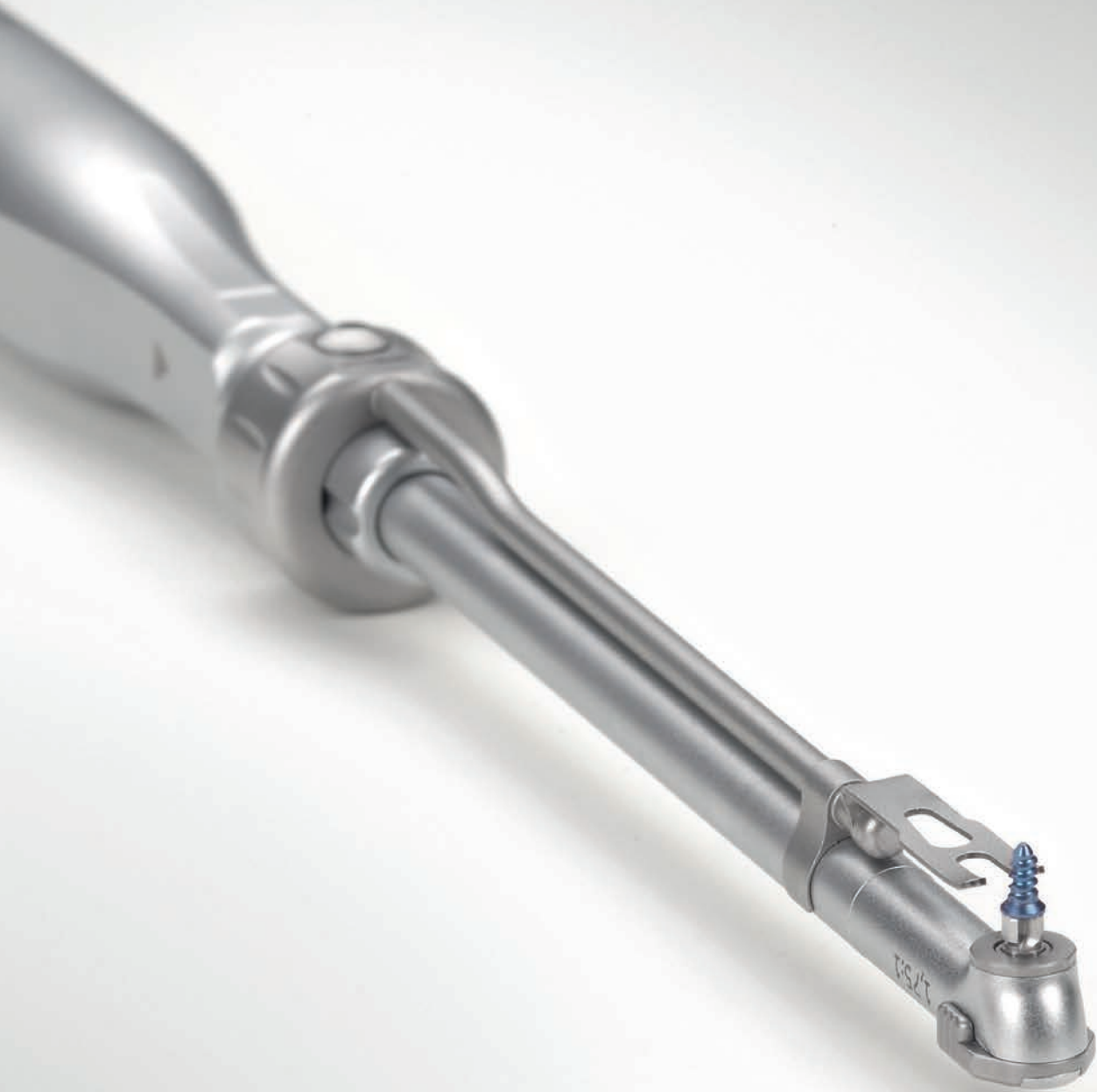
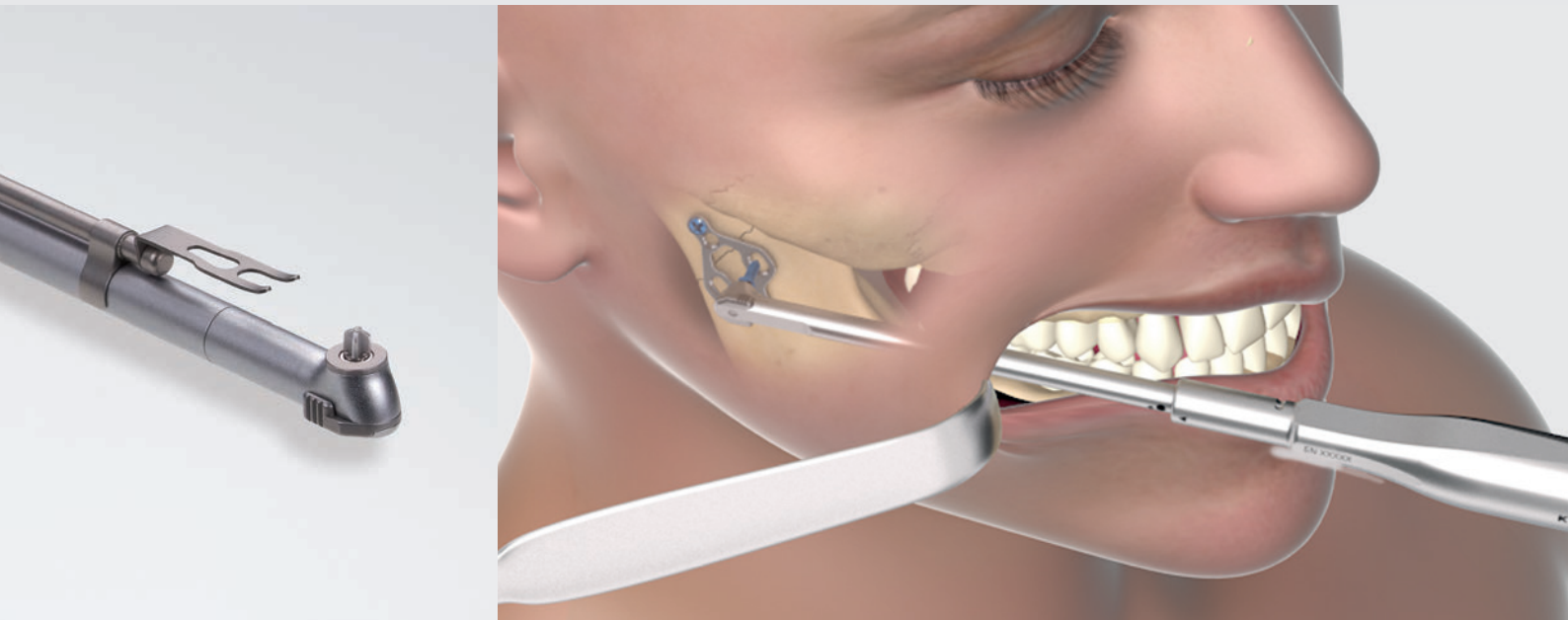


Table of Contents

	Pages
Feature, Function and Benefit	6 - 9
Step by Step to Optimal Care	10 - 19
Assembly	12 - 15
Surgical Technique	16 - 19
System Components	20 - 21
Storage	22
Recommended Set Configuration	23

Feature, Function and Benefit

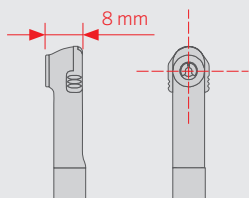


In osteosynthesis of the mandibular ramus and condyle transoral access has become ever more important. Miniaturized instruments especially developed for this indication are indispensable.

The angled screwdriver is a useful tool, allowing the surgeon to implant screws, plates, and distractors under the most constricted spatial conditions and without visible scarring.

Angulus 2

New design



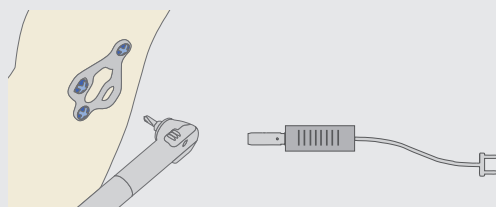
Feature

- Low profile (8 mm) head and slim shaft geometry
- Centered tool mount

Benefit

- Best view possible in site
- Perfect transmission of force without tool canting
Suitable on both sides

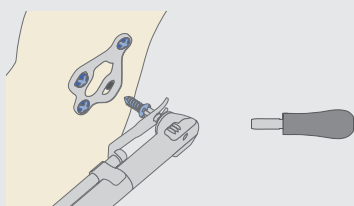
Function



- Standardized INTRA coupling (ISO 3964)

- Suitable for numerous motor systems of various manufacturers

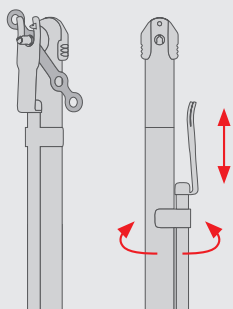
- For motor driven pre-drilling



- Gear ratio 1.75 : 1
Universal coupling for turning handle

- For easier manual screw down

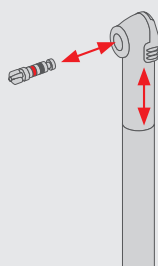
Screw/implant holding device



- Optional adaptable holding device for screws up to 2.5 mm in diameter and corresponding plates or distractors

- Allows one-handed insertion of screws, plates, and distractors
- After use, the holding device can be pushed back and turned sideways, thus giving the best view possible in the site

Tool change



- Quick release chuck

- Rapid intraoperative tool change in just two steps without additional measures

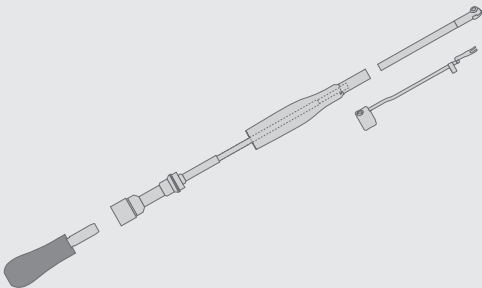
Feature, Function and Benefit



Specially configured storage trays help sustain the value of the angled screwdriver. They ensure clear and gentle storage and facilitate the appropriate sterilization of all system components.

Angulus 2

Disassembly



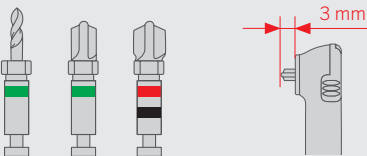
Feature

- Plug, screw and bayonet lock

Benefit

- Toolless disassembly in just a few steps
- Rapid delivery for postoperative processing
- Easy cleaning and disinfection

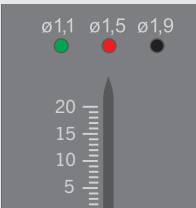
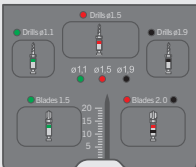
Tools



- Low installed height
- Color coding
- Form-fit

- Good handling
Best view possible in site
- Quick and safe selection of appropriate tool
- Secure tool grip in head of angled screwdriver

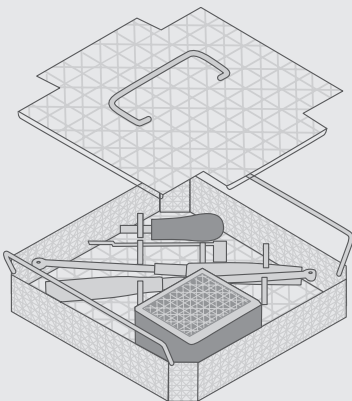
Small parts storage



- Compact design
- Separate color coded compartments for twist drills and blades
- Diameter and depth meter for twist drill

- Made for wire basket
- Clear tool storage
- Controlled tool selection and storage

Wire basket



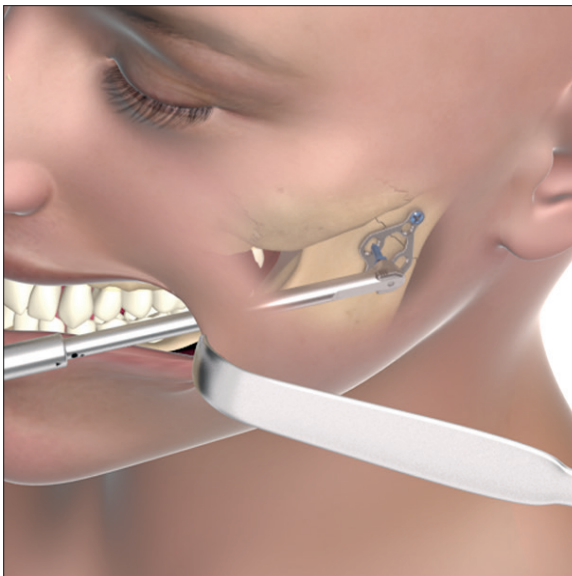
- Standard dimensions:
L 255 x W 245 x H 50 mm
- Silicone and PPSU storage elements
- Lid

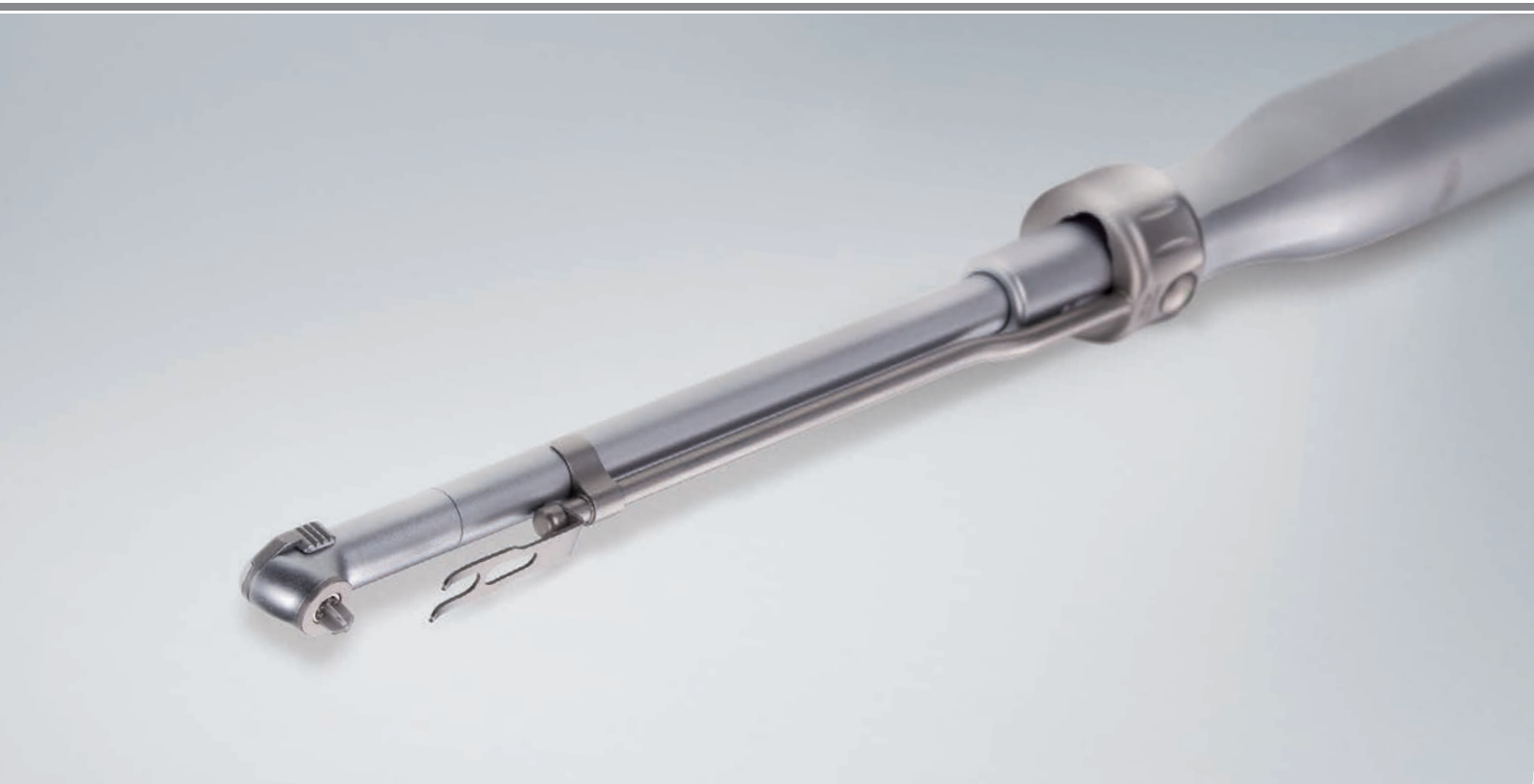
- Made for standardized half-size containers
- Clearly arranged storage for two angled screwdrivers, one turning handle, one screw holding device and small parts storage
- Protected against spilling

Step by Step to Optimal Care

Use

The angled screwdriver Angulus 2 is suited for transoral osteosynthesis at the mandibular body and ramus.





Handling and Surgical Technique

Assembly

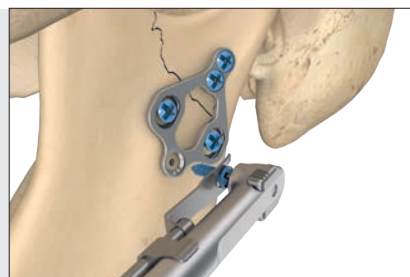
Pages 12-15

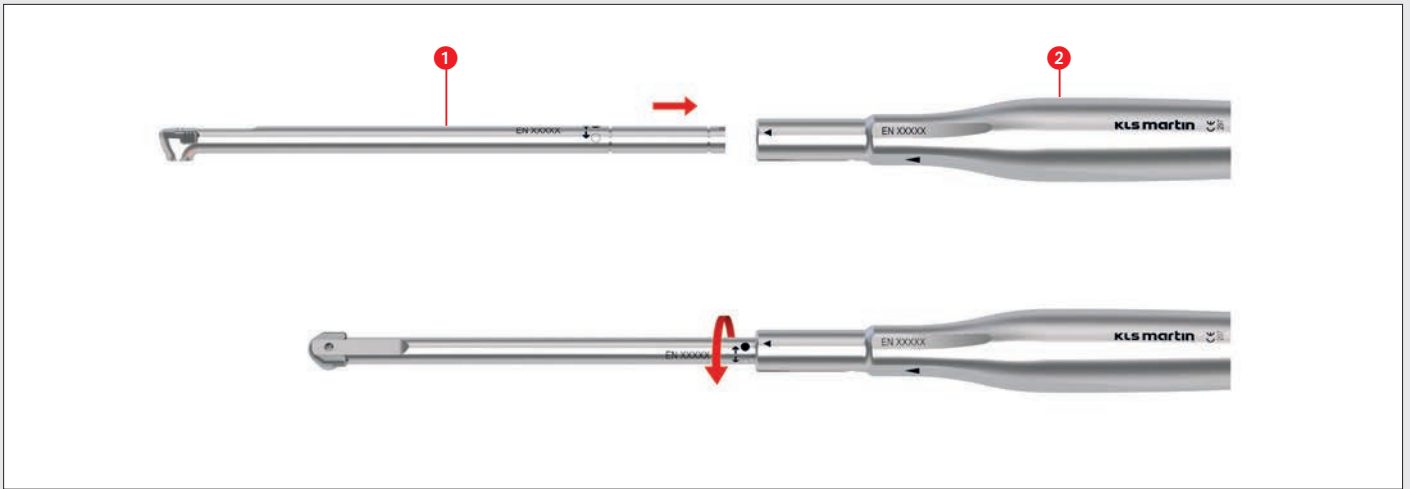


Surgical Technique

Exemplified by implantation of a
“Rhombic” 3D Condylar Plate

Pages 16-19



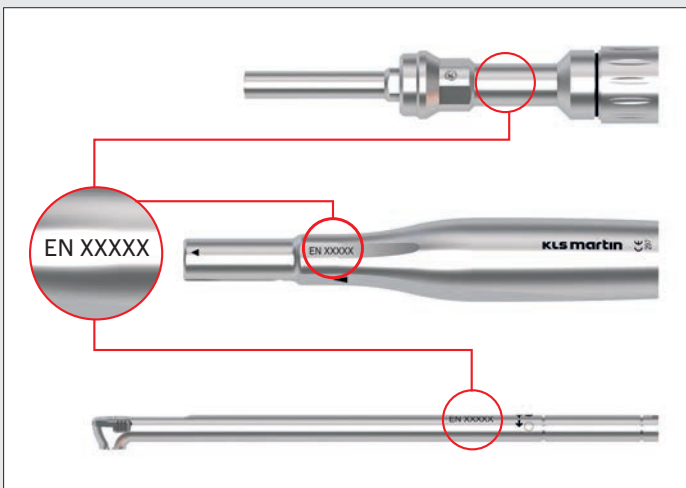


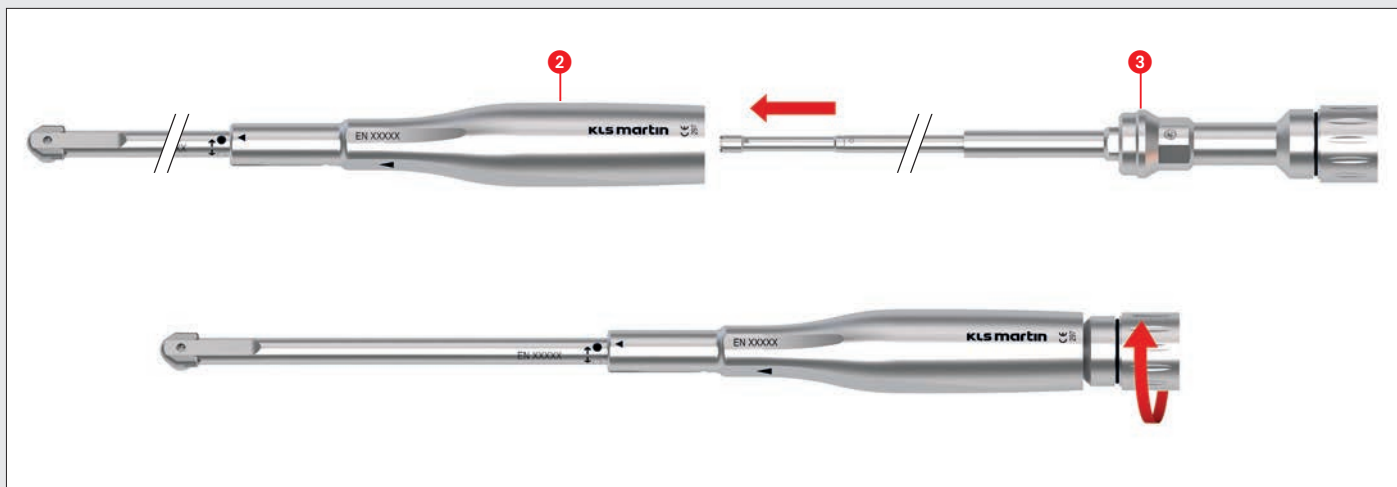
1. Inserting the head

Slide the head ① into the sheath ② until fully seated.

Observe the icons and twist from ○ “open” to ● “locked”.

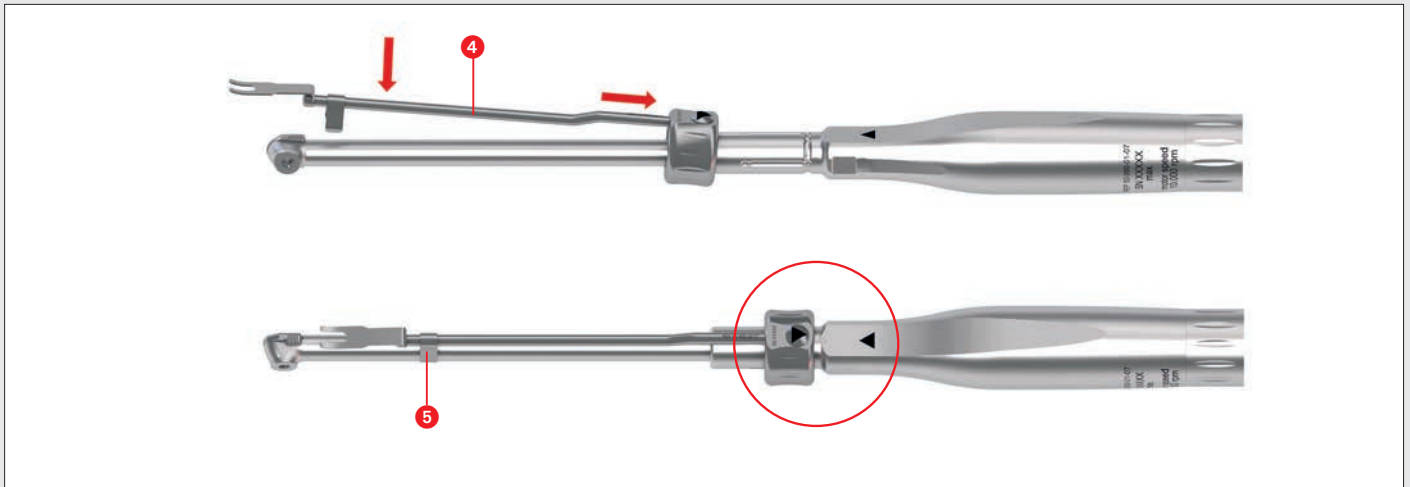
Note:
During assembly verify that the EN (serial numbers) of the components match. Especially when using several angled screwdrivers.





2. Mounting the shaft

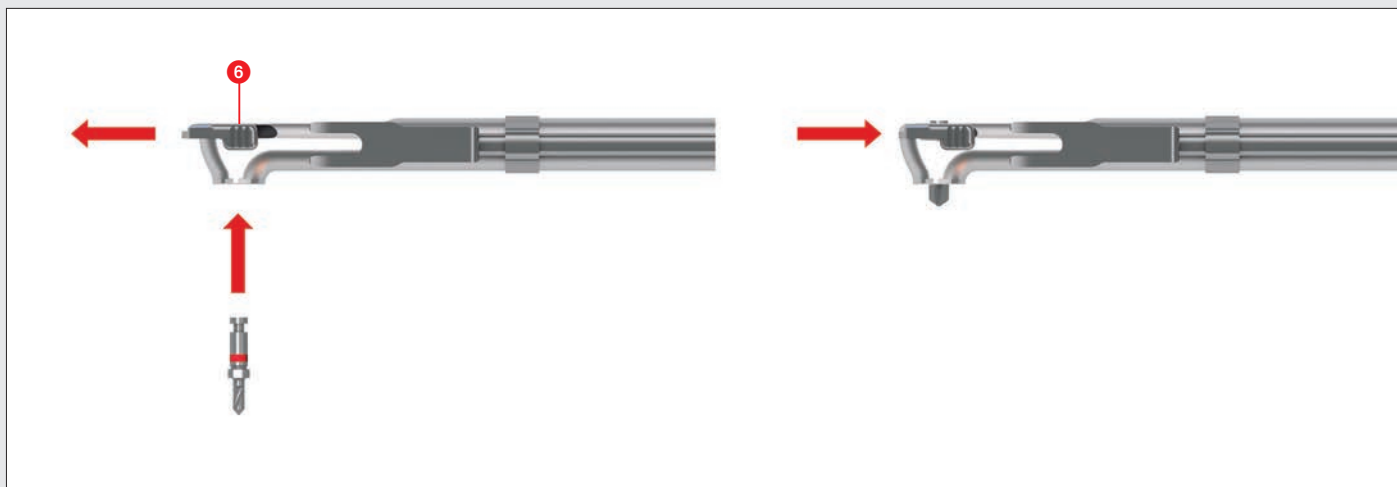
Slide the shaft ③ into the sheath ② and tighten in clockwise direction.



3. Attaching screw/implant holding device

Slide the screw holding device ④ over the sheath until it engages with an audible click.

Check the position and click-fit the clip ⑤ of the screw holding device.



4. Clamping and unclamping the tool

All the twist drills or corresponding screwdriver blades listed on page 21 can be used with the angled screwdriver. After opening the tension clamp ⑥, the desired tool can be inserted and then locked securely by pushing back into the initial position.

After the tool has been inserted, the appropriate drive is attached:

- Twist drills: automatic (motor)
- Screws: manual (turning handle)

The tool is removed by opening the tension clamp as described above.

Tip:

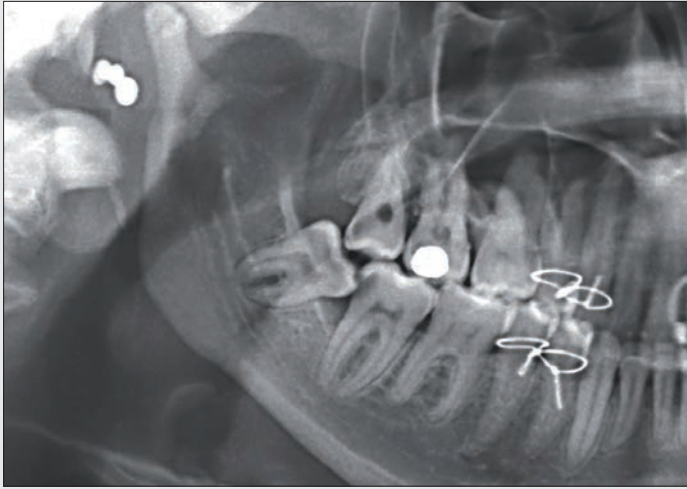
Using a second Angulus 2 allows rapid intraoperative changeover between pre-drilling and screw insertion.



Angulus2
with motor drive



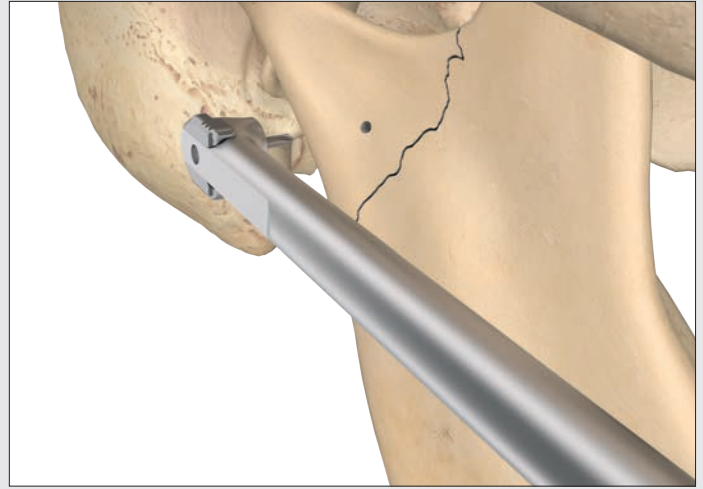
Angulus2 with turning handle
and screw holding device



Source: Prof. Dr. Dr. Günter Lauer, University Clinic Dresden

Preoperative planning

The x-ray shows a typical medially dislocated condylar process fracture, Spiessl and Schroll type II.



1. Predrilling

As condylar process fractures are nearly always dislocated, the surgeon will generally first place the osteosynthesis screw which is closest to the fracture gap of the fractured condyle and therefore easy to access. For pre-drilling, mount the angled screwdriver on the motor and pre-drill with a maximum motor speed of 4,375 rpm.

Note:

Since the angled screwdriver has a gear ratio of 1.75:1, the motor speed of 4,375 rpm results in a speed of 2,500 rpm for the drill bit.

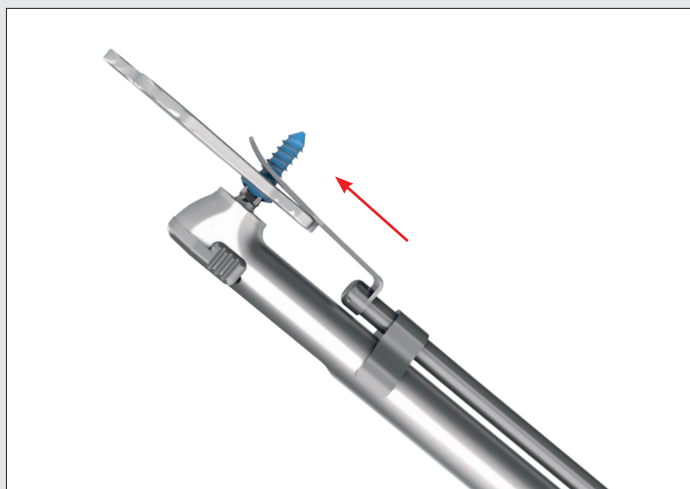
Important: Never use the Angulus 2 at speeds above 10,000 rpm.



Angulus2
with motor drive

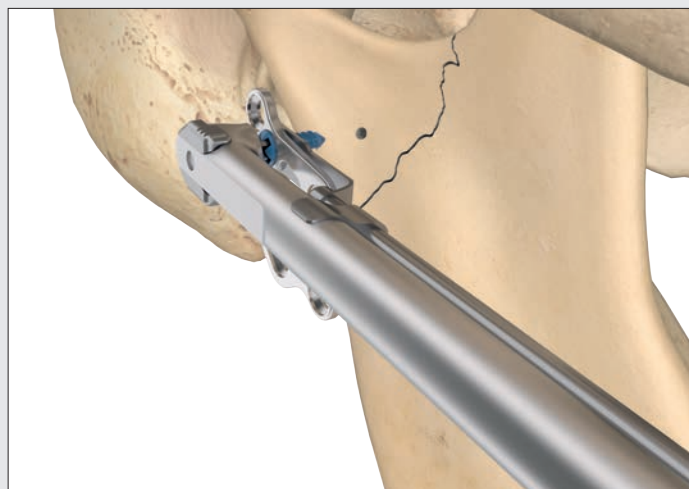


Twist drill
for Angulus2



2. Clamping screw and plate

Pick up the screw and clip the corresponding plate hole into the screw. Then push the screw holding device, which can optionally also be used as plate holding device, forward to fixate the implants.



3. Insertion of the implants

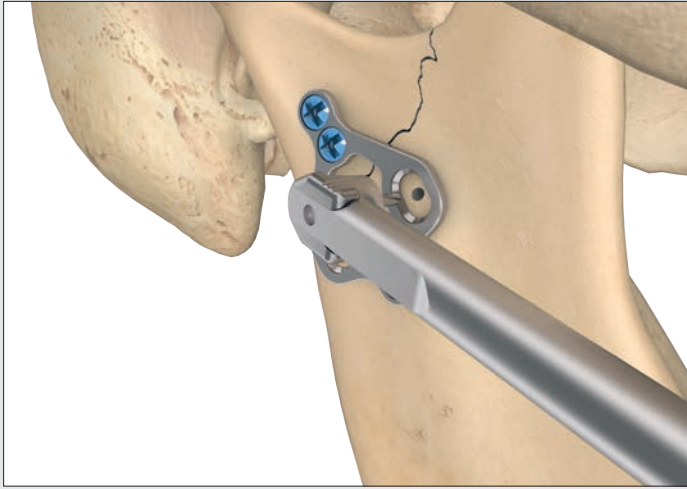
To implant the first screw, the turning handle is first attached to the angled screwdriver. Once the screw has found purchase in the bone, the screw and plate holding device is retracted. Then the implants can be pre-fixedated.



Angulus2 with turning handle and screw holding device



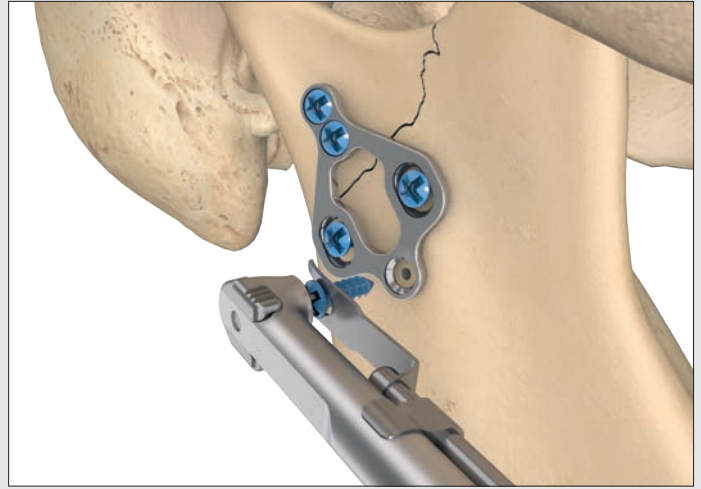
Screwdriver blade for Angulus2



4. Pre-drilling of additional screw holes

To achieve the desired fracture position, the drill holes in the gliding holes of the plate are set as caudally as possible.

Once the surgeon has convinced himself/herself of the correct anatomical position of the condyle or the cranial fragment, then this position can be secured successively with further screws in the caudal, intact region of the jaw. Due to the special gliding hole geometry of the plate, there are still 2.5 mm of glide path available for any further corrections if necessary. After setting the desired fracture reduction, the screws are tightened firmly in the gliding holes.



5. Placement of the final screw

The final osteosynthesis screw is placed as soon as the fracture has been sufficiently repositioned. This screw cancels the gliding hole effect.



Angulus2
with motor drive



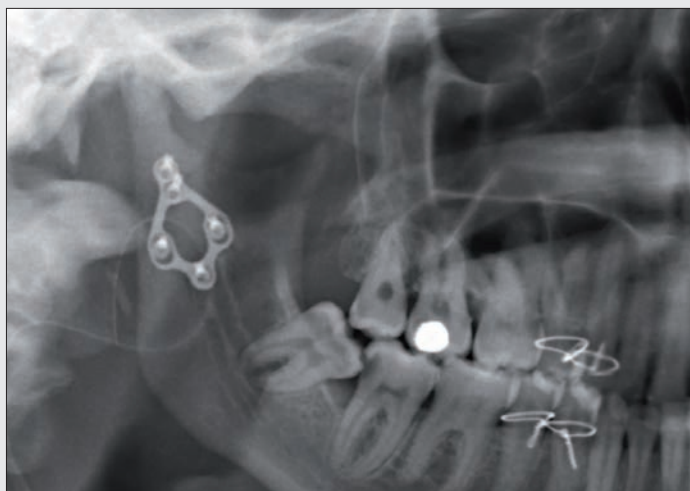
Twist drill
for Angulus2



Angulus2 with turning handle
and screw holding device



Screwdriver blade
for Angulus2



Source: Prof. Dr. Dr. Günter Lauer, University Clinic Dresden

Postoperative control

The postoperative x-ray shows the repositioned condyle process and the correct position of the “Rhombic” 3D condylar plate which was implanted safely and effectively using the Angulus2.

Angled Screwdriver **Angulus2** System Components



1/2

50-990-00-07

Angled screwdriver, complete
with turning handle and
screw holding device

St 1



1/2

50-990-01-07

Angled screwdriver
without turning handle and
screw holding device

St 1



1/2

50-990-05-07

Turning handle
(spare part)

St 1



1/2

50-990-06-07

Screw holding device
(spare part)

St 1



Explanation of icons

- Stainless steel
- Attachment Angulus WSD
- Packaging unit
- maxDrive®
- Centre Drive®
- Ø 1.2 mm
- Ø 1.5 mm
- Ø 2.0 mm
- Ø 2.3 mm

STERILE | R Sterile packaging

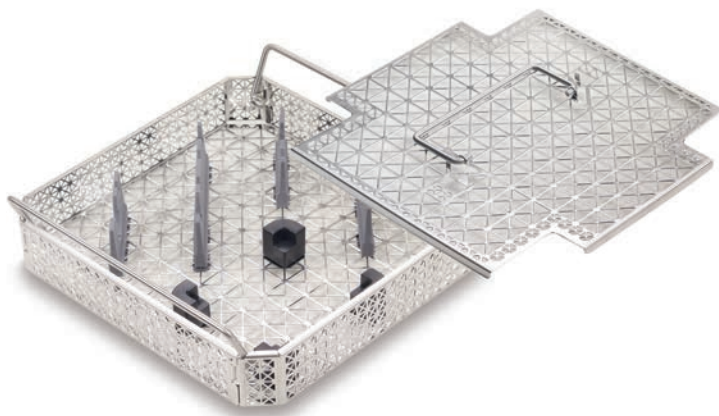
Twist Drills

<div> </div> <div>STERILE R</div> <div> </div>			
Ø	S	Item no.	
1.0 mm	15 mm	50-994-10-07	
1.0 mm	15 mm	50-994-10-71	
1.1 mm	5 mm	50-995-05-07	
1.1 mm	7 mm	50-995-07-07	
1.1 mm	17 mm	50-995-17-07	
1.2 mm	15 mm	50-994-12-07	
1.2 mm	15 mm	50-994-12-71	
1.5 mm	5 mm	50-996-05-07	
1.5 mm	7 mm	50-996-07-07	
1.5 mm	9 mm	50-996-09-07	
1.5 mm	11 mm	50-996-11-07	
1.5 mm	13 mm	50-996-13-07	
1.5 mm	15 mm	50-996-15-07	
1.5 mm	17 mm	50-996-17-07	
1.9 mm	5 mm	50-997-05-07	
1.9 mm	7 mm	50-997-07-07	
1.9 mm	19 mm	50-997-19-07	

Screwdriver Blades

<div> </div> <div>STERILE R</div> <div> </div>			for screws	Item no.
			Ø 1.2 mm	
			maxDrive®	50-991-12-07
			Ø 1.5 mm	
			maxDrive®	50-991-15-07
			Centre Drive®	50-992-15-07
			Ø 2.0/2.3 mm	
			maxDrive®	50-991-20-07
			Centre Drive®	50-992-20-07

Angled Screwdriver **Angulus 2** Storage



50-990-40-04

Wire basket for angled
screwdriver Angulus2

including lid and holding elements
(without contents)



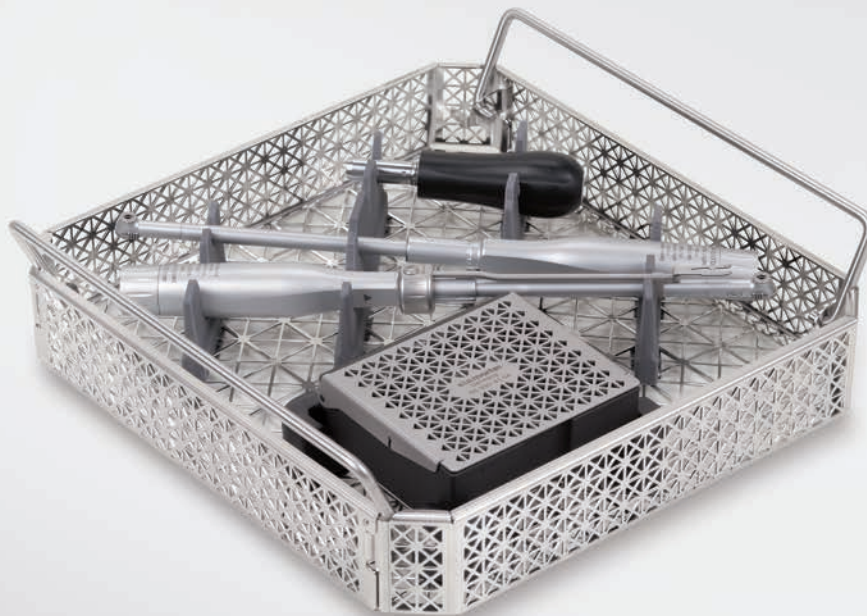
50-990-41-04

Small parts storage
for twist drills and screwdriver blades

(without contents)

50-990-42-04

Spare parts holding elements



Angulus2

Recommended set configuration*

(* for use with maxDrive® screws 1.5 mm and 2.0 mm)

Angled screwdriver		
50-990-00-07	Angled screwdriver Angulus2, complete	1 unit
50-990-01-07	Angled screwdriver Angulus2, only	1 unit

Twist drill for screws Ø 1.5 mm		
50-995-05-07	Twist drill for Angulus2 WSD, 1.1 x 5 mm	2 units
50-995-07-07	Twist drill for Angulus2 WSD, 1.1 x 7 mm	2 units
50-995-17-07	Twist drill for Angulus2 WSD, 1.1 x 17 mm	1 unit

Twist drill for screws Ø 2.0 mm		
50-996-05-07	Twist drill for Angulus2 WSD, 1.5 x 5 mm	4 units
50-996-07-07	Twist drill for Angulus2 WSD, 1.5 x 7 mm	4 units
50-996-09-07	Twist drill for Angulus2 WSD, 1.5 x 9 mm	2 units
50-996-13-07	Twist drill for Angulus2 WSD, 1.5 x 13 mm	1 unit
50-996-17-07	Twist drill for Angulus2 WSD, 1.5 x 17 mm	1 unit

Screwdriver blades		
50-991-15-07	Screwdriver blade maxDrive® 1.5 for Angulus2 WSD	2 units
50-991-20-07	Screwdriver blade maxDrive® 2.0 for Angulus2 WSD	2 units

Storage		
50-990-40-04	Wire basket for Angulus2 WSD	1 unit
50-990-41-04	Small parts storage for Angulus2 WSD	1 unit

KLS Martin Group

KLS Martin Australia Pty Ltd.

Sydney · Australia
Tel. +61 2 9439 5316
australia@klsmartin.com

KLS Martin do Brasil Ltda.

São Paulo · Brazil
Tel. +55 11 3554 2299
brazil@klsmartin.com

KLS Martin Medical (Shanghai) International Trading Co. Ltd

Shanghai · China
Tel. +86 21 5820 6251
china@klsmartin.com

KLS Martin India Pvt Ltd.

Chennai · India
Tel. +91 44 66 442 300
india@klsmartin.com

Martin Italia S.r.l.

Milan · Italy
Tel. +39 039 605 67 31
italia@klsmartin.com

Nippon Martin K.K.

Tokyo · Japan
Tel. +81 3 3814 1431
nippon@klsmartin.com

KLS Martin SE Asia Sdn. Bhd.

Penang · Malaysia
Tel. +604 506 2380
malaysia@klsmartin.com

KLS Martin de México S.A. de C.V.

Mexico City · Mexico
Tel. + 52 55 7572 0944
mexico@klsmartin.com

Martin Nederland/Marned B.V.

Huizen · Netherlands
Tel. +31 35 523 45 38
infonl@klsmartin.com

Gebrüder Martin GmbH & Co. KG

Moscow · Russia
Tel. +7 499 792 76 19
russia@klsmartin.com

KLS Martin Taiwan Ltd.

Taipei 106 · Taiwan
Tel. +886 2 2325 3169
taiwan@klsmartin.com

Gebrüder Martin GmbH & Co. KG

Dubai · United Arab Emirates
Tel. +971 4 454 16 55
middleeast@klsmartin.com

KLS Martin UK Ltd.

Reading · United Kingdom
Tel. +44 118 467 1500
uk@klsmartin.com

KLS Martin LP

Jacksonville · Florida, USA
Tel. +1 904 641 77 46
usa@klsmartin.com

Gebrüder Martin GmbH & Co. KG

A company of the KLS Martin Group

KLS Martin Platz 1 · 78532 Tuttlingen · Germany
P.O. Box 60 · 78501 Tuttlingen · Germany
Tel. +49 7461 706-0 · Fax +49 7461 706-193
info@klsmartin.com · www.klsmartin.com