

HBS 2 Resorb Mg and **mm.CS**

Headless Cannulated Compression Screws - resorbable

Osteosyntheses are our passion! It is our ambition to advance these together with our clinical partners. Every day we work on developing innovative products and services which meet the highest demands on quality, and which contribute to the wellbeing of the patient.

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HBS 2 Resorb Mg and mm.CS Metal and yet resorbable

After over 100,000 successful HBS and HBS 2 implantations worldwide, it was time to evaluate the experience gained and start a new era – the introduction of the HBS 2 Resorb Mg compression screw. This innovative screw uses a special magnesium alloy as an absorbable material and retains the proven HBS 2 geometry so that the existing HBS 2 instruments and accessories can continue to be used.

In order to promote the advantages of magnesium technology in a targeted manner, KLS Martin is working together with Medical Magnesium GmbH, a young start-up from Aachen, which has specialized in the use of magnesium in osteosynthesis since 2018.

This collaboration offers many advantages. The resorbable magnesium implants enable optimal patient care without the need for metal removal or a second operation. In addition, these magnesium implants are used for the first time with a modified surface that slows down resorption and minimizes hydrogen gas formation, resulting in faster restoration of the original bone condition.

In addition, our users benefit from extended treatment options thanks to this collaboration. The extensive portfolio enables a wide range of procedures, particularly in foot and knee surgery. At the same time, the proven ergonomics of the HBS 2 instruments and accessories are retained, ensuring seamless integration into existing procedures.

The synergy between KLS Martin and Medical Magnesium results in an advanced material technology that combines metallic stability and resorbability in a unique innovation platform to provide novel and patient-oriented solutions in fracture stabilization.

Feature, Function and Benefit



HBS 2 Resorb Mg and mm.CS screws are available in the following dimensions in sterile packaging:

	Total length	Length of thread, proximal	Length of thread, distal
HBS 2 Resorb Mg mini Ø 2.5 short thread HBS 2 Resorb Mg mini Ø 2.5 long thread	10 - 30 mm (1-mm steps)	2.6 mm	4 - 6 mm
	20 - 40 mm (2-mm steps)	3.7 mm	9 -13 mm
HBS 2 Resorb Mg midi Ø 3.0 short thread	10 - 30 mm (1-mm steps)	3.5 mm	4 - 6 mm
HBS 2 Resorb Mg midi Ø 3.0 long thread	20 - 40 mm (2-mm steps)	5.0 mm	9 -13 mm
mm.CS 2.8	10 - 34 mm (2-mm steps)	3.8 mm	4 - 9mm
mm.CS 3.5	10 - 40 mm (2-mm steps)	4.0 mm	4 -10mm
mm.CS 5.0	30 - 60 mm (2-/5-mm steps)	4.8 mm	8 -15mm

The screws of all variants are made of the magnesium alloy WE43, with an additional surface modification. This leads to improved mechanical stability compared to pure magnesium or other magnesium alloys. Additionally, it allows for slower and more controlled degradation, thus providing fractures or osteotomies with sufficient mechanical support until consolidation.

During the resorption process, gas may be released, which appears as a shadow around the implant when imaging. This is a normal part of the process and should not be confused with signs of the implant becoming loose. To accurately assess the position and volume of the released gas, we recommend viewing postoperative X-rays from several planes.

HBS 2 Resorb Mg and mm.CS – Implants

	Feature and Function	Benefits
	 Compression screw, cannulated, made of resorbable magnesium. In the proven HBS 2 and mm.CS geometry. 	 Easy placement of the screw due to cannulation. Can be implanted flush with the bone surface, including defined and reproducible compression. Higher stability compared to resorbable polymers. Biocompatibility according to international standards. Clearly visible in X-ray imaging and in CT for intra- and postoperative monitoring. No removal of metal/second surgery necessary.
	 Surgical technique for HBS 2 and HBS 2 Resorb Mg is largely identical. 	 Continued use of HBS 2 instruments. Intuitive application.
	 Ceramized surface (surface modification). 	 Retarded resorption for optimal bone healing and integration in the bone tissue. Minimized formation of hydrogen gas.
	 Resorption process (approx. 24 to 36 months, depending on the implant size and the patient-specific metabolism). 	 Controlled and bony remodeling of the screw. Formation of new and compact bone material.
12 24,305 Mgg 39 88,906 Vagnesium Yttrum Zreconum 1,31 1,74 Yttrum 1,22 4,47 Recent	 Magnesium alloy (magnesium, yttrium, zirconium, rare earths). 	 Rare earths as an alloy component ensure increased mechanical stability when compared to pure magnesium.



- T7/T8/T15 with self-retaining function.
 Easy pick-up, insertion and removal
 - of the screw.

Feature, Function and Benefit



The instruments are color-coded for easy and efficient handling. Only a few instruments are required for treatment.

Given the mechanical features of the magnesium screws, it is necessary to open the cortex prior to implantation. For this purpose, the existing HBS 2 instrument set was supplemented with a countersink. The twist drill already included in the HBS 2 set is suitable for pre-drilling as required for the magnesium screws.

This provides the option of treating indications with both HBS 2 and HBS 2 Resorb Mg using just a single instrument set.

As a user, you are also given the option of using the mm.CS magnesium implants with the corresponding mm.CS instrument set.

HBS 2 Resorb Mg and **mm.CS** – Instruments and Storage

	Feature and Function	Benefits
HBS 2 Resorb Mg mm.CS	 The overall portfolio includes three storage units: - HBS 2 Resorb Mg mini/midi Ø 2.5/Ø 3.0 - mm.CS 2.8 and 3.5 - mm.CS 5.0 	 Modular design for specific use.
	 Reusable countersink for opening the cortex. The countersink is the only addition to the existing HBS 2 set of instruments. 	 Reduced torque for implanting the screws. Titanium and magnesium screws can be implanted using largely the same instruments and the same storage unit.
Co C	 Color-coded instruments: HBS 2 Resorb Mg mini Ø 2.5 • HBS 2 Resorb Mg midi Ø 3.0 • mm.CS 2.8 • mm.CS 3.5 • mm.CS 5.0 • 	Easier identification of the respective instruments.
	 Stainless steel storage unit in reprocessing-optimized design combined with high-performance plastic. 	 High stabilty, but low weight. Large openings ensure excellent rinsing capability. No water residues. Good ergonomics.

Step by Step to Optimal Treatment

Fields of Use

HBS 2 Resorb Mg

The HBS 2 Resorb Mg is used for the treatment of intra-articular and extra-articular fractures and pseudarthroses of small bones and bone fragments, as well as for arthrodeses on small joints.

mm.CS

The mm.CS is used for reconstructive procedures to restore bone continuity and stabilize the correction in the osteosynthesis of fractured bones and osteotomies of small bones, for the refixation of small cortical, cancellous and osteochondral fragments or avulsion fractures and for the arthrodesis of small joints.

Examples for Use



- Fractures of the processus styloideus radii
- Practures of the processus styloideus ulnae
- ③ Scaphoid fractures
- 4 Metacarpal fractures
- 6 Phalangeal fractures
- 6 DIP arthrodeses



- Fractures of the epicondylus lateralis/medialis humeri
- 2 Proximal radial head fractures



- Fractures of the epicondylus lateralis/medialis femoralis
- Bony tears of the posterior cruciate ligament
- 3 Osteochondral fractures of the patella



- Fracture treatment of the malleolus lateralis/ medialis
- 2 Tarsus/metatarsus: TMT-1 fusions
- 3 Metatarsus: Jones fractures
- Metatarsus: Hallux valgus corrections with, for example, Scarf osteotomies
- 6 Metatarsus: Weil osteotomies
- 6 Phalanges: Akin osteotomy
- Phalanges: PIP fusions

Examples for Use in Foot Surgery: mm.CS

Case study 1: Hallux valgus correction

Hallux valgus correction by means of Scarf and Akin osteotomy. Use of the mm.CS 3.5 for the distal metatarsal osteotomy and the mm.CS 2.8 in the phalanx. Imaging was performed preoperatively and at follow-up after six weeks and then three months.

Reference:

Dr. Oliver Gottschalk, Schön-Klinik Munich-Harlaching

Case study 2: refixation of the medial malleolus osteotomy

Refixation of the medial malleolus osteotomy for treatment of an osteochondral lesion on the talus with two mm.CS 5.0, 44 mm length. Parallel ligament reconstruction with suture anchors. Imaging was performed immediately postoperatively and at the 6-week follow-up, where gas accumulation around the screws is evident.

Reference: PD Dr. Christan Plaaß, Diakovere Annastift Hanover



Pre-op



Six weeks post-op



Three months post-op



Post-op



Six weeks post-op



Six weeks post-op

Examples for Use in Knee Surgery: mm.CS

Case study 3: avulsion fracture of the posterior cruciate ligament

Using a posterior approach, the avulsion fragment, which was torn out by the posterior cruciate ligament, was refixed stably with two mm.CS 3.5 of length 38 mm. The images show the fracture condition directly post surgery.

Case study 4: treatment of the medial femoral condyle

Fixation of an osteochondral fragment in the femoral condyle with two mm.CS 2.8. Imaging was performed pre-op and six months post-op.

Reference: PD Dr. Clemens Kösters, Maria-Josef-Hospital Greven Reference: PD Dr. Christoph Kittl, University Hospital Münster



Pre-op



Post-op



Pre-op



Six months post-op

Implants HBS 2 Resorb Mg



HBS 2 Resorb Mg mini Ø 2.5 mm



Total length (mm)	STERILE	Length of thread, distal D (mm)
10	53-800-10-04	4.0
11	53-800-11-04	4.0
12	53-800-12-04	4.0
13	53-800-13-04	4.0
14	53-800-14-04	5.0
15	53-800-15-04	5.0
16	53-800-16-04	5.0
17	53-800-17-04	5.0
18	53-800-18-04	5.0
19	53-800-19-04	5.0
20	53-800-20-04	5.0
21	53-800-21-04	6.0
22	53-800-22-04	6.0
23	53-800-23-04	6.0
24	53-800-24-04	6.0
25	53-800-25-04	6.0
26	53-800-26-04	6.0
27	53-800-27-04	6.0
28	53-800-28-04	6.0
29	53-800-29-04	6.0
30	53-800-30-04	6.0

HBS 2 Ø 2.5 I	Resorb Mg mini ong thread	
Length of P = 3.75 Mg (3)	thread, proximal mm ¹ / ₁	Total ler
Total length (mm)	STERILE	Length of thread, distal D (mm)
20	53-801-20-04	9.0
22	53-801-22-04	9.0
24	53-801-24-04	9.0
26	53-801-26-04	10.0
28	53-801-28-04	10.0
30	53-801-30-04	11.0
32	53-801-32-04	11.0
34	53-801-34-04	12.0
36	53-801-36-04	12.0
38	53-801-38-04	13.0

53-801-40-04

13.0

40



HBS 2 Resorb Mg midi Ø 3.0 mm



HBS 2 Resorb Mg midi Ø 3.0 short thread		gth D
Length of thread, proximal P = 3.5 mm	1/1	Total ler
Mg 💿 🕕	. 1	9608

Total length (mm)	STERILE	Length of thread, distal D (mm)
10	53-802-10-04	4.0
11	53-802-11-04	4.0
12	53-802-12-04	4.0
13	53-802-13-04	4.0
14	53-802-14-04	5.0
15	53-802-15-04	5.0
16	53-802-16-04	5.0
17	53-802-17-04	5.0
18	53-802-18-04	5.0
19	53-802-19-04	5.0
20	53-802-20-04	5.0
21	53-802-21-04	6.0
22	53-802-22-04	6.0
23	53-802-23-04	6.0
24	53-802-24-04	6.0
25	53-802-25-04	6.0
26	53-802-26-04	6.0
27	53-802-27-04	6.0
28	53-802-28-04	6.0
29	53-802-29-04	6.0
30	53-802-30-04	6.0

HBS 2 Ø 3.0 W Length of P = 5.0 m Mg (\textcircled{o})	Resorb Mg midi ong thread thread, proximal m 1/1	Total length
Total length (mm)	STERILE	Length of thread, distal D (mm)
20	53-803-20-04	9.0
22	53-803-22-04	9.0
24	53-803-24-04	9.0
26	53-803-26-04	10.0
28	53-803-28-04	10.0
30	53-803-30-04	11.0
32	53-803-32-04	11.0
34	53-803-34-04	12.0
36	53-803-36-04	12.0
38	53-803-38-04	13.0
40	53-803-40-04	13.0

Instruments HBS 2 Resorb Mg









Instruments HBS 2 Resorb Mg







26-850-10-09

without stop

26-850-10-71



26-850-01-07 Soft tissue sleeve



Storage Unit **HBS** 2

The HBS 2 storage unit consists of various modules.

All HBS 2 instruments required for an operation are stored individually in the instrument tray. In addition, there is a free storage space which can be used individually.



Storage System		
HBS 2 Resorb Mg mini Ø 2.5	HBS 2 Resorb Mg midi Ø 3.0	
55-910-59-04	55-910-59-04	Lid
55-910-58-04	55-910-58-04	Insert (without contents)
55-910-56-04	55-910-56-04	Storage cage (without contents)

Standard Instruments		
HBS 2 Resorb Mg mini Ø 2.5	HBS 2 Resorb Mg midi Ø 3.0	
26-875-02-07	26-850-02-07	K-wire guide
26-875-13-07	26-850-13-07	K-wire dispenser
26-875-00-05	26-850-00-05	Guide wire
26-875-06-07	26-850-06-07	Depth gauge
26-875-01-07	26-850-01-07	Soft tissue sleeve
26-875-17-07	26-850-17-07	Screwdriver
26-875-03-07	26-850-03-07	Cleaning wire
26-875-19-09	26-850-19-09	Twist drill
53-876-00-09	53-876-50-09	Countersink

Implants mm.CS



 Image: T8, cannulated Ø 1.2 mm

 Image: F8, cannulated Ø 1.2 mm

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mm.CS 2.8

mm.CS 2.8	
Length of thread, proximal P = 3.8 mm	Total lengt
Mg 🔞 💶	

STERILE	Length of thread, distal D (mm)
53-928-10-04	4.0
53-928-12-04	4.0
53-928-14-04	4.0
53-928-16-04	4.0
53-928-18-04	5.0
53-928-20-04	5.0
53-928-22-04	6.0
53-928-24-04	6.0
53-928-26-04	7.0
53-928-28-04	7.0
53-928-30-04	8.0
53-928-32-04	8.0
53-928-34-04	9.0
	STERILE I I 53-928-10-04 53-928-12-04 53-928-12-04 53-928-14-04 53-928-16-04 53-928-20-04 53-928-20-04 53-928-22-04 53-928-22-04 53-928-24-04 53-928-26-04 53-928-28-04 53-928-30-04 53-928-32-04

mm.CS	3 .5		
Length of P = 4.0 m	thread, proximal Im	Total lengt	
Mg 🕲	unit(a) 1/1		
Total length (mm)	STERILE	Length of thread, distal D (mm)	
10	53-935-10-04	4.0	
12	53-935-12-04	4.0	
14	53-935-14-04	4.0	
16	53-935-16-04	4.0	
18	53-935-18-04	5.0	
20	53-935-20-04	5.0	
22	53-935-22-04	6.0	
24	53-935-24-04	6.0	
26	53-935-26-04	7.0	
28	53-935-28-04	7.0	
30	53-935-30-04	8.0	
32	53-935-32-04	8.0	
34	53-935-34-04	9.0	
36	53-935-36-04	9.0	
38	53-935-38-04	10.0	
40	53-935-40-04	10.0	







mm.CS 5.0	
Length of thread, proximal P = 5.0 mm	Fotal lengt
Total	I anoth of throad

Total length (mm)	STERILE	Length of thread, distal D (mm)
30	53-950-30-04	8.0
32	53-950-32-04	8.0
34	53-950-34-04	9.0
36	53-950-36-04	9.0
38	53-950-38-04	10.0
40	53-950-40-04	10.0
42	53-950-42-04	11.0
44	53-950-44-04	11.0
46	53-950-46-04	12.0
48	53-950-48-04	12.0
50	53-950-50-04	14.0
55	53-950-55-04	14.0
60	53-950-60-04	15.0

Instruments mm.CS

mm.CS 2.8 Standard Instruments:





Instruments mm.CS

mm.CS 3.5 Standard Instruments:





St 1 O St 1

St 1

St 1

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AO attachment for mm.CS 2.8/3.5

 \bigcirc

St 1

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Instruments mm.CS

mm.CS 5.0 Standard Instruments:





Storage mm.CS

The mm.CS storage unit consists of various modules. One storage unit is available for the mm.CS 2.8 and 3.5 screws and a second for the mm.CS 5.0 screws.

All mm.CS instruments required for a surgical procedure are stored individually in the instrument tray.



Storage System			
mm.CS 2.8	mm.CS 3.5	mm.CS 5.0	
53-900-46-07	53-900-46-07	53-900-47-07	Lid
53-900-16-04	53-900-16-04	53-900-27-04	Storage cage (without contents)
Standard Instruments			
mm.CS 2.8	mm.CS 3.5	mm.CS 5.0	
53-900-02-07	53-900-02-07	53-900-18-07	Universal sleeve
53-900-00-07	53-900-01-07	53-900-17-07	Drill sleeve

53-900-02-07	53-900-02-07	53-900-18-07	Universal sleeve
53-900-00-07	53-900-01-07	53-900-17-07	Drill sleeve
53-900-04-07	53-900-05-07	53-900-20-07	K-wire guide
53-900-03-07	53-900-03-07	53-900-19-07	Trocar
53-900-40-07	53-900-41-07	26-130-18-07	K-wire dispenser
53-900-06-07	53-900-07-07	53-900-21-07	K-wire
53-900-10-07	53-900-10-07	53-900-24-07	Depth gauge for K-wires
53-900-11-07	53-900-12-07	53-900-25-07	Drill
53-900-08-07	53-900-08-07	53-900-23-07	Countersink
53-900-09-07	53-900-09-07	53-900-22-07	Screwdriver blade
53-900-14-07	53-900-14-07	53-900-14-07	MagDriver Handle QC M
53-900-15-07	53-900-15-07	53-900-26-07	Cleaning wire

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