MAGNEZIX

STABILITY WITHOUT COMPROMISES

MAGNEZIX® PIN: AT FIRST METAL – THEN BONE

UP TO 5x
MORE STABLE
THAN POLYMER PINS!

Intelligent innovations for a better life.
www.syntellix.com

SYNTELLIX

The benefits at a glance

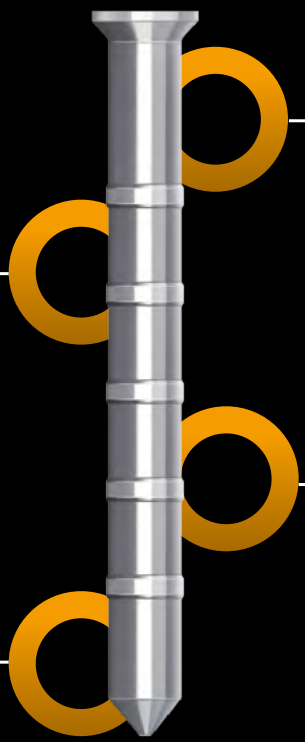
Metallic and transformable.

Osteoconductive.

Reduced risk of infection.

Suitable for MRI and CT diagnostics.

Minimal radiological artifacts.



Free of cobalt, chrome, nickel and aluminium.

Excellent biocompatibility, no known allergies.

Superior stability compared to PLA/PGA implants.

Prevents "stress shielding".

EUROPEAN INNOVATION PARTNERSHIP on Active and Healthy Ageing
INNOVATIVE SOLUTION

cdgw Preisträger 2016 Deutscher Zukunftspreis Gesundheitswirtschaft

TOP 100 top100.de Top-Innovator 2015 & 2016

INNOVATIONSPREIS DER DEUTSCHEN WIRTSCHAFT Sieger 2012/13

MAGNEZIX

MAGNEZIX® Pin

KEEPS ITS PROMISES

Innovation has no end: MAGNEZIX®, the world's unique material for metal implants **that are both stable and transformable,** is now also available as a pin!

No more compromises: The metallic MAGNEZIX® Pins are mechanically stable and therefore **much more resilient** than conventional polymer implants. However, unlike normal metal screws or wires, **they do not need to be removed** – instead, they degrade completely within the body and are replaced by endogenous tissue.

The ideal solution: MAGNEZIX® implants are suitable for all indications that require temporary but **secure fixation** of the bone, but for which remaining material or a surgical removal of the metal following the healing process is not desirable. The MAGNEZIX® Pin therefore opens up a broader spectrum of indications – particularly for **trauma and sports surgery.**

CE

MAGNEZIX® *[ma'gnezjks]: A magnesium alloy (Mg content > 90%) with unique stability properties and material of the world's first approved bioabsorbable metal implants.*

MAGNEZIX® Pins offer you:

Stability: MAGNEZIX® Pins offer significantly greater stability than polymer pins.

Transformation: MAGNEZIX® Pins transform in the body and will be replaced by endogenous bone tissue.

Osteoconductivity: MAGNEZIX® implants stimulate bone growth.

Inhibition of infection: When magnesium degrades, an alkaline, anti-bacterial environment is created.

Tolerance: The components of the alloy are not known to cause any allergic reactions.

A WORLD FIRST!

The MAGNEZIX® principle
First healing, then dissolving! *MAGNEZIX® Pins combine* ***metallic stability*** *and* ***transformation,*** *setting new standards for traumatology and sports surgery.*

SUPERIOR STABILITY

UP TO 5 TIMES MORE STABLE THAN POLYMER PINS (E.G. PLA)

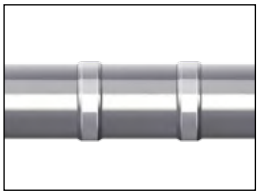
Setting new standards: MAGNEZIX® Pins boast mechanical stability values far superior to those of previously available bioresorbable materials. Both initially and during the degradation process, MAGNEZIX® Pins offer considerably **greater stability than comparable PLA pins** and even those with larger dimensions. **That means superior stability that is sure to impress during day-to-day surgery.** Not only this, MAGNEZIX® can offer you and your patients even more benefits: **osteoconductivity, inhibition of infection** and very high **tolerance levels.**

DESIGN AND FUNCTION

SOPHISTICATED DETAILS FROM THE HEAD TO THE TIP

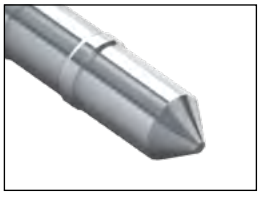
Head design

The flat design of the MAGNEZIX® Pin head enables the bone fragment to be repositioned with a high degree of stability and the pin head to be completely countersunk.



Axially stabilising shaft design

The symmetrically positioned collars on the pin shaft result in the compression of the free bone fragment during impaction of the implant. In addition, they increase the axial positioning precision of the implant.

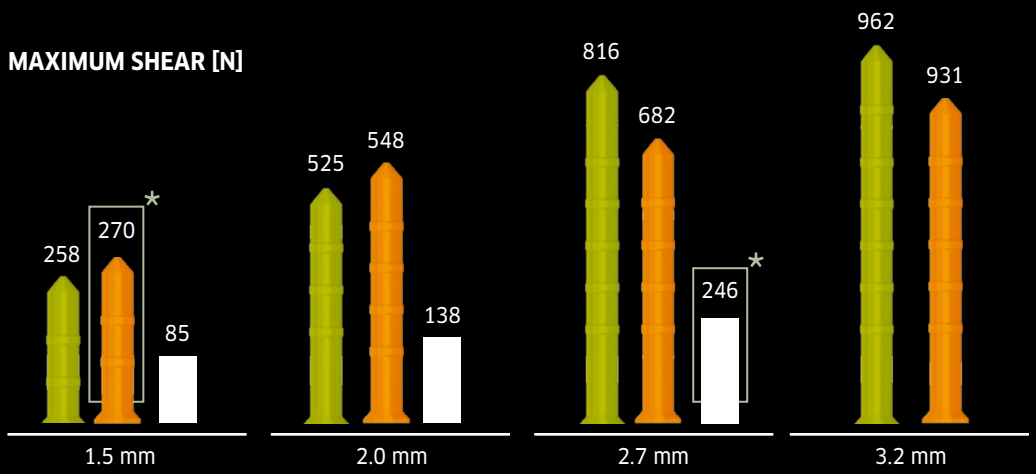


Design of the pin tip

The tip design of the MAGNEZIX® Pin displaces cancellous bone, thereby compressing the implant bed and facilitating positioning.

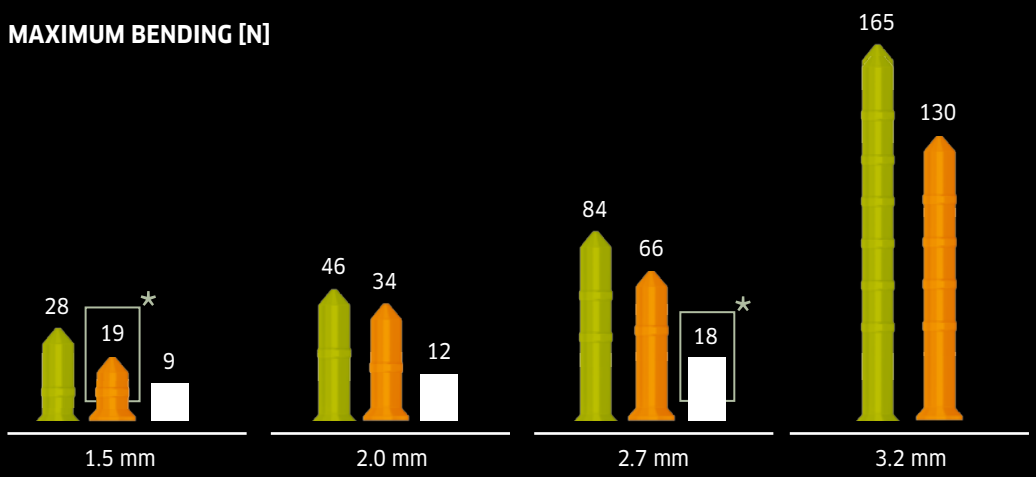
Comparative stability values

MAXIMUM SHEAR [N]



(Tested in accordance with ASTM F1044-05 | ASTM F2502-11 | Load rate 5 mm/min)

MAXIMUM BENDING [N]



(Tested in accordance with ASTM F1264-14 | ASTM F2502-11 | Load rate 5 mm/min)

MAGNEZIX® Pin
0 h corrosion

MAGNEZIX® Pin
288 h corrosion[1]

PLA pin
0 h degradation

Corrosion: PBS | 37°C | pH 7.4

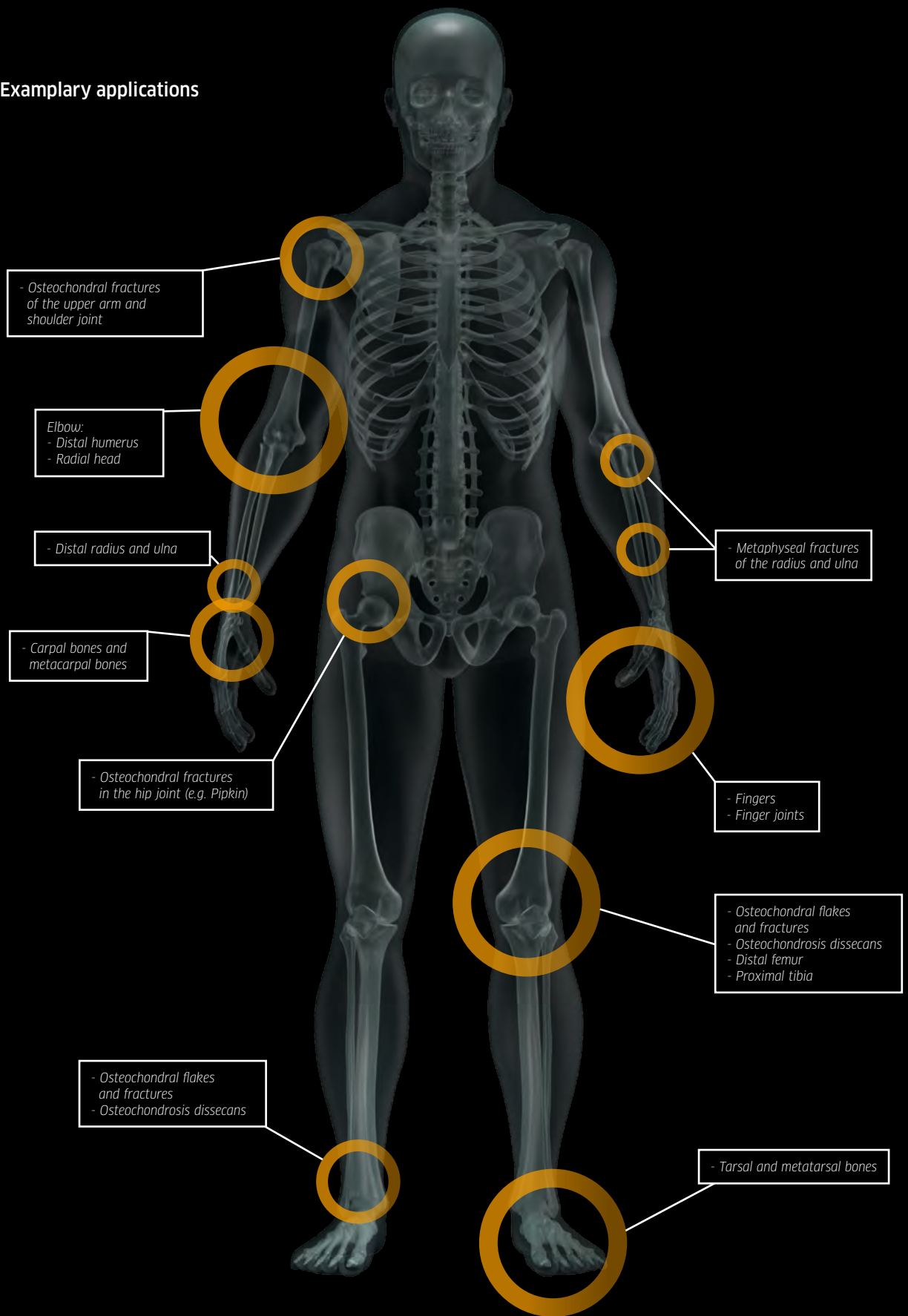
*

IMPRESSING STABILITY!

Not only initially, but also when corroded, even the smallest MAGNEZIX® Pin 1.5 offers significantly better stability than a larger, non-degraded PLA pin with a diameter of 2.7 mm.

[1] 288 hours of corrosion *in vitro* correspond to approx. 80 days *in vivo* (individual values may vary according to the patient and the implant bed).

Examplary applications



INDICATIONS

A MULTITUDE OF TRAUMATOLOGY APPLICATIONS

MAGNEZIX® implants are ideally suited for indications in acute medicine or sports medicine that require **secure fixation of the bone** with no foreign material remaining in the body – a **clear advantage** for you and your patients.

The indications for MAGNEZIX® Pins are reconstructive procedures following fractures and misalignment of the human skeleton, for example:

- Intra-articular and extra-articular fractures of small bones and bone fragments
- Arthrodeses and osteotomies of small bones and joints
- Small osseous ligament and tendon ruptures
- Osteochondral fractures and dissecates

Indications for MAGNEZIX® Pin 1.5 include:

- Phalangeal and metacarpal bones
- Osteochondrosis dissecans

Indications for MAGNEZIX® Pin 2.0 include:

- Carpal, metacarpal, tarsal and metatarsal bones
- Ulnar and radial styloid processes
- Capitulum of the humerus and radial head

Indications for MAGNEZIX® Pin 2.7 and 3.2 include:

- Pipkin fractures
- Metaphyseal fractures of the radius and ulna

A QUICKER RETURN TO FITNESS!

*MAGNEZIX® implants stimulate **bone growth,** support the **healing process** and help to avoid unnecessary sick days and risks, as **no foreign material** that could cause problems and requires removal remains within the body.*

THE MAGNEZIX® MATERIAL

REVOLUTIONARY AND PIONEERING

While metal implants that convert to bone may at first seem like fantasy, this has become a reality for medicine following years of research into materials.

Specifically, MAGNEZIX® is **a magnesium-based alloy (more than 90 % Mg content)**, which, despite its metallic properties, **completely degrades within the body** and is replaced **by endogenous tissue**. The biomechanical properties of MAGNEZIX® closely resemble those of human bone.

Some studies have also shown that **magnesium-based alloys exhibit osteoconductive[2] properties.** As magnesium is degraded by means of corrosion, an alkaline, anti-bacterial environment is also created in the immediate vicinity of the implant. For this reason, MAGNEZIX® (> 90 % Mg) can be expected to exhibit **anti-infective properties.**

Advantages for users and patients:

- The mechanical properties (e.g. bending, tension, torsion) are significantly better than those of conventional resorbable implants.
- Fully conversion of the implant to endogenous tissue makes subsequent removal of the metal unnecessary.
- Histological investigations show bone formation at the surface of the implant, as well as bone growth in the implant areas where resorption has already taken place.
- The favorable elasticitiy (Young's modulus) of MAGNEZIX® implants helps to prevent "stress shielding".
- There are barely any differences in application between MAGNEZIX® implants and conventional implants made of steel or titanium.
- MAGNEZIX® implants are radiologically visible, conditionally MRI-proof and only generate minimal artifacts.
- Cost savings as MAGNEZIX® eliminates the need to prepare/plan and perform an implant removal.

[2] Revell et al.: The effect of magnesium ions on bone bonding to hydroxyapatite coating on titanium alloy implants. Key Eng Mater 2004:254-256:447-50.
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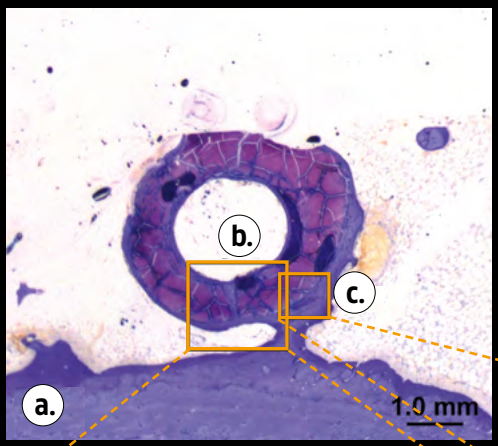
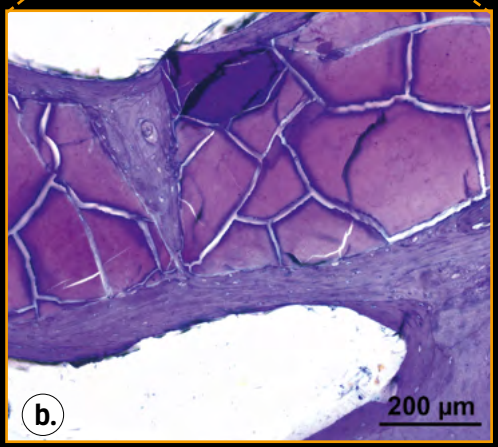
MAGNEZIX

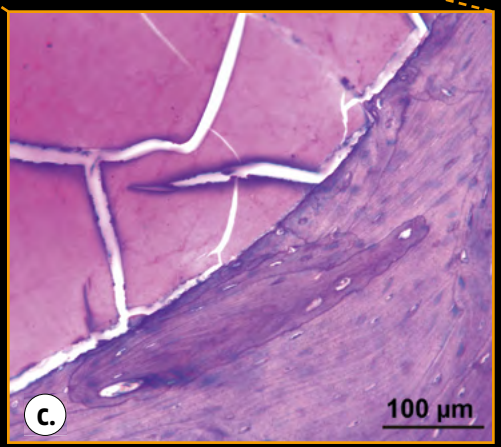
Supporting the healing process



Overview a: *Histological evaluations of an animal study have shown complete conversion of the metal implant after a 12-month implantation period.*



Section b: *Formation of new bone (osteoid) on the surface of the degraded implant has been histologically demonstrated.*



Section c: *The presence of osteoclasts and osteoblasts characterises the bone conversion process.*

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THE IMPLANTS

PRODUCT OVERVIEW

Depending on size, the MAGNEZIX® Pin can be used as a bone pin for children, adolescents or adults for the adaptation-stable or exercise-stable fixation of bones, bone fragments or osteochondral fragments for areas that are only subjected to minor loads.

PIN	DIMENSIONS		LENGTHS
MAGNEZIX® Pin 1.5 	**Diameter** **Head diameter**	1.5 mm 2.5 mm	8 to 30 mm (in 2-mm increments)
MAGNEZIX® Pin 2.0 	**Diameter** **Head diameter**	2.0 mm 3.0 mm	8 to 40 mm (in 2-mm increments)
MAGNEZIX® Pin 2.7 	**Diameter** **Head diameter**	2.7 mm 4.0 mm	12 to 50 mm (in 2-mm increments)
MAGNEZIX® Pin 3.2 	**Diameter** **Head diameter**	3.2 mm 5.0 mm	12 to 50 mm (in 2-mm increments)

OTHER MAGNEZIX® IMPLANTS

CS	DIMENSIONS		LENGTHS
MAGNEZIX® CS 2.0 	**Diameter** **Head diameter**	2.0 mm 2.5 mm	8 to 24 mm (in 2-mm increments), non-cannulated
MAGNEZIX® CS 2.7 	**Diameter** **Head diameter** **Guide wire**	2.7 mm 3.5 mm 1.0 mm	10 to 34 mm (in 2-mm increments), cannulated
MAGNEZIX® CS 3.2 	**Diameter** **Head diameter** **Guide wire**	3.2 mm 4.0 mm 1.2 mm	10 to 40 mm (in 2-mm increments), cannulated

CBS	DIMENSIONS		LENGTHS
MAGNEZIX® CBS 2.0 	**Diameter** **Head diameter**	2.0 mm 4.0 mm	6 to 20 mm (in 2-mm increments)
MAGNEZIX® CBS 2.7 	**Diameter** **Head diameter**	2.7 mm 5.0 mm	6 to 30 mm (in 2-mm increments)
MAGNEZIX® CBS 3.5 	**Diameter** **Head diameter**	3.5 mm 6.0 mm	8 to 40 mm (in 2-mm increments)

For further information, please contact our field team or write to us at: **info@syntellix.com**

ADDITIONAL LITERATURE AND STUDIES

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Implants are manufactured in cooperation with Königsee Implantate GmbH in Germany.

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