Compromises were yesterday. The future is here and now.
Creating the future with innovative materials

Aerospace, aviation, Formula 1 – inconceivable without high-tech materials made from carbon fiber. Carbon’s superb properties represent the basis of modern space technology. Aircraft are lighter and safer. Formula 1 drivers are well protected by the strength of carbon fiber.

The worldwide unique icotec process makes these outstanding material properties now also available to modern medicine. Icotec implants made of carbon fiber-reinforced polyetheretherketone (Carbon/PEEK) facilitate patient's recovery. Their almost artifact-free imaging in CT and MRI opens up new possibilities in diagnostic and therapeutic procedures.
icotec implants made of Carbon/PEEK - the perfect combination of nature and technology
Optimized imaging opens up new possibilities in diagnostic and therapeutic procedures

Using modern materials, icotec is taking a completely new approach to spinal fusion and stabilization technology. Pedicle screws, rods and cages made of an innovative composite material permit optimized CT and MRI monitoring. Radiotherapies are no longer limited by metal implants. The new materials have been combined with existing and proven surgical techniques. All implants made of Carbon/PEEK can also be combined at will with conventional metal systems.

As a comparison:
left: Titanium screw
right: icotec screw made of Carbon/PEEK

BONE CONTACT
WHERE REQUIRED
Titanium coating in the area around the pedicle for direct integration at the point where anchoring takes place

Optimized CT imaging enables a better assessment of important structures.

MRI properties of icotec Carbon/PEEK implants permit unique imaging of soft tissues.
BONE-FRIENDLY IMPLANT SURFACE
Titanium coating for fast, direct integration and fusion

HARMONIZED LOAD TRANSFER
resulting in less stress shielding due to a better match of the Carbon/PEEK material properties

CARBON/PEEK IMPLANT
inside Carbon/PEEK outside titanium coating

OPTIMIZED IMAGING
in X-Ray, CT and MRI
Harmonized load-transfer combined with improved assessment and diagnostic options

Thanks to continuous innovation, icotec has succeeded in developing a unique pedicle screw made of carbon fiber polyetheretherketone (Carbon/PEEK). Made of high quality composite material, the screw improves anatomical images in CT and MRI and facilitates the postoperative diagnosis. It has a high fatigue strength due to the high percentage of endless carbon fibers in the material. A harmonized load-transfer takes place due to a better compliance of the Carbon/PEEK material properties. The system is compatible with icotec’s titanium pedicle system and can thus be expanded as desired.

Antero-posterior and lateral radiographs. Carbon/PEEK screw and rod ends are visible with markers. No interference of the screws, the anatomy is thus easy to assess.
Preoperative MRI

Patient with osteochondrotic degenerative disc disease and spinal stenosis L5/S1; MRI sagittal.

Intraoperative X-ray

Intraoperative X-rays, L5/S1 with Carbon/PEEK pedicle screws. Also shown with Kirschner wire for fluoroscopic control. Interbody support with the ETurn™ TLIF Cage.

Postoperative MRI

Postoperative MRI control. Location and integrity of the Carbon/PEEK pedicle screws are clearly visible and easy to assess. Diagnostically important structures (radicular structures, foramina and lateral recessus) are represented optimally.
The icotec pedicle system: an overview

Benefits

• nearly artifact-free imaging of the pedicle screws, rods and cages thanks to X-ray transparent material

• Titanium coating of screws and cages for optimum bone contact

• Harmonized load transfer from the screw into the vertebral body and lower stress in the bone-screw interface due to a better compliance of the Carbon/PEEK material properties to bone, when compared to titanium

Properties

• Cannulated Carbon/PEEK pedicle screw system made of radiolucent material

• Proven geometry and surgical technique

• Titanium screw head and X-ray marker at the tip for controlled insertion

• Self-tapping titanium screws also available

• Carbon/PEEK systems can be combined at will with conventional system components made of titanium

Indications

The icotec Pedicle System is intended to provide mono- or polysegmental dorsal stabilization of the spine for:

• Instability and malpositions, fractures, tumors

• Correction of low-grade spondylolisthesis

• Degenerative segment diseases, stenoses of the lumbar spine
The spine is the most common location for skeletal metastases. Non-metallic Carbon/PEEK implants with their unique properties, unmatched by metal implants, change the way supportive care will be provided in the treatment of spinal tumors.

- **Planning:** modern radiotherapy is based on 3D imaging data from CT or MRI scans. With the use of Carbon/PEEK material imaging artefacts are significantly reduced, planning of the radiation dose distribution can be performed quickly and correctly.

- **Application:** icotec’s non-metallic Carbon/PEEK implants allow the radiation beam to pass unimpeded through the implant into the tumor, without shielding or scattering radiation which is common in metal implants. Healthy tissue is preserved.

- **Follow-up control:** the significantly reduced imaging artifacts allow the treating medical team to investigate the zone around the treated / removed tumor in detail without compromise to check thoroughly for possible changes (recurrences).

Distribution of isodoses after planning of radiation therapy is depending on artifact formation during CT imaging. Carbon/PEEK implants produce negligible distortions in the area of the diagnostically relevant structures.
Axial CT for planning of radiation therapy. Unobstructed view of the epidural space and the pedicle trajectory. Intended visibility of radiopaque markers at the screw tips with slight artefact formation in this section plane in the anterior vertebral body. The radiation oncologist can use those coordinates for matching the planning with the therapy sessions.

Clear identification of correct screw position as well as unobjected planning of radiation therapy in the peridural area.

Intraoperative anteroposterior fluoroscopy

Sagittal radiograph for postoperative follow-up.
Our product portfolio

Lumbar spine
Pedicle System PSI / ETurn™ TLIF Cage / PLIF Cage

Cervical spine
Cervical plate and cage system CPI & CSI

Wrist
dist. radius plate DRI

Shoulder
prox. humerus plate PHI

icotec ag
Industriestrasse 12
9450 Altstätten,
Switzerland
Phone: +41 71 757 00 00
Fax: +41 71 757 00 01
info@icotec.ch
www.icotec.ch

Not available for sale within the United States.