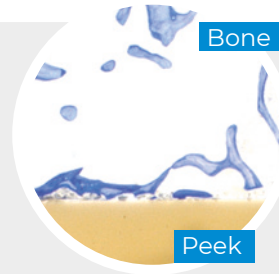
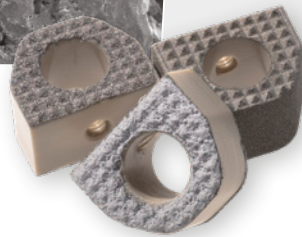
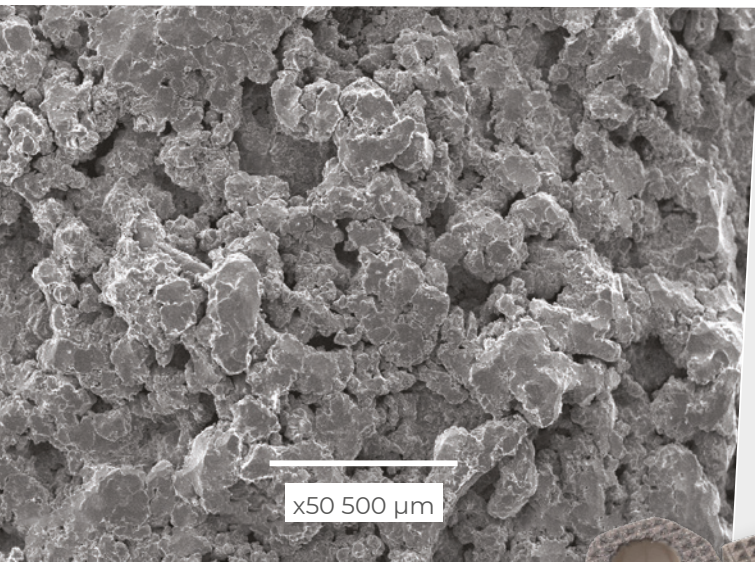


Coating on PEEK

Spondycoat® and Ti-Growth® P: introducing the new Plasma Spray Coating family for PEEK-based components.



Limited direct bone implant contact with uncoated PEEK

Ti Coating enables direct bone implant contact for devices made from PEEK



Features and benefits

- Coatings available in titanium and hydroxyapatite
- Highly adherent
- Enhanced osseointegration

Examples of application

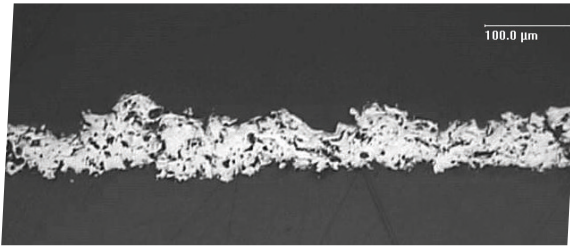
- Interbody fusion devices
- Vertebral body replacement
- Artificial disc replacements
- Fixation screws

PEEK is a biocompatible, inert biomaterial and some concerns have been raised about the inertness of **PEEK** and its limited fixation to bone.

Using **PEEK** surface functionalization by Plasma Spray coating with osteoconductive materials (i.e. Hydroxyapatite or Titanium) direct osseointegration can be achieved for coated devices.

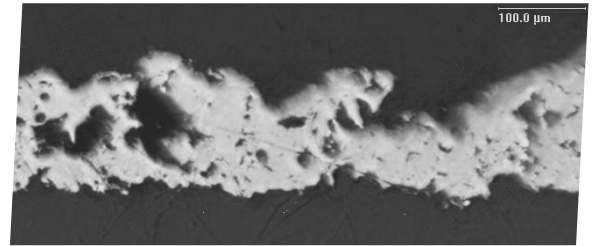
Plasma Spray coatings for PEEK

SPONDYCOAT®-T 371A



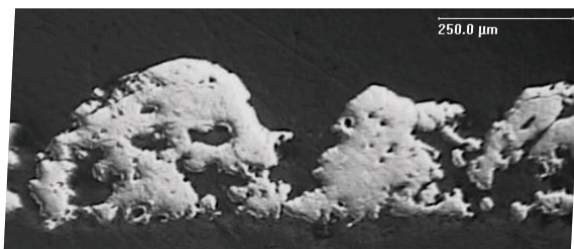
Spondycoat®-T 371A is a Titanium coating with low roughness (representative values of Ra 4-10 µm) mainly indicated for thin layers (recommended thickness 60-120 µm).

SPONDYCOAT®-T 107



Spondycoat®-T 107 is a Titanium coating with high roughness (representative values of Ra 20-40 µm) and a recommended thickness of 125-250 µm.

TI-GROWTH® P



Ti-Growth® P is a porous Titanium coating with high roughness (representative values of Ra 40-80 µm) and a recommended thickness of 300-500 µm.

SPONDYCOAT®-HA



Spondycoat®-HA is a Hydroxyapatite coating with low roughness (representative values of Ra 4-8 µm) mainly indicated for thin layers (recommended thickness 45-85 µm).

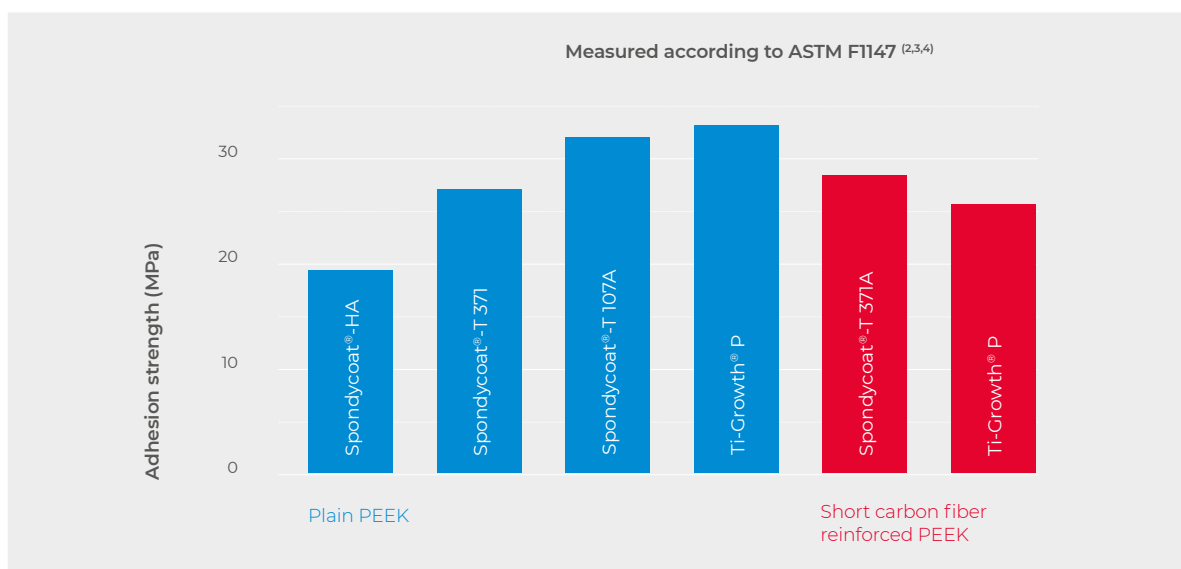
Compatible substrates

All these coatings can be applied to devices made of:

/ Plain PEEK / Short carbon fiber reinforced PEEK / Barium sulfate filled PEEK

Further coating solutions are available or may be developed upon specific request.

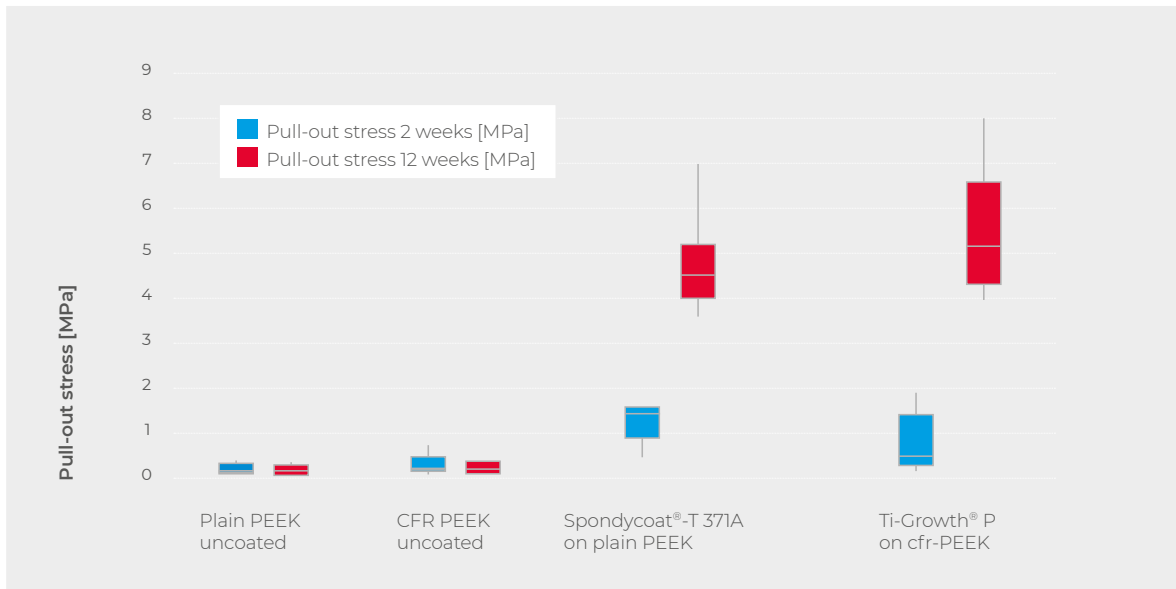
All Spondycoat® and Ti-Growth® P coatings have characteristics in compliance with ASTM standards and FDA Guidance singular. A comprehensive data set about the influence of Plasma Spray process on PEEK performances has been collected. It is available upon request and may help device designers in choosing the proper coating for the specific application.



Biological characterization of Spondycoat[®] and Ti-Growth[®] P coatings

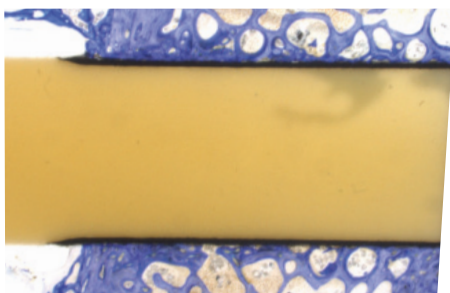
Implantation study performed in sheep pelvis model.

Bone to implant fixation measured by pull out^{6,7,8,9}

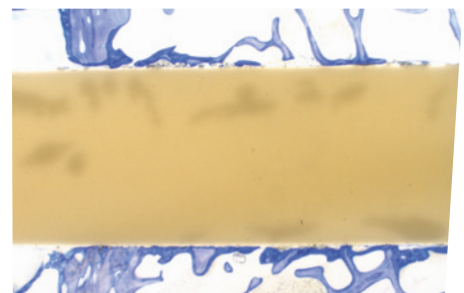


The presence of the coating enhances direct bone-to-implant contact and it allows stronger fixation of the implant into the bone after two weeks of implantation. After twelve weeks in the pelvis bone, the coated implants achieve significantly higher values of mechanical fixation.

Histological evaluation after 12 weeks of implantation



Coated implants show higher osteointegration than uncoated PEEK: the bone is in direct contact with the coating, whereas limited direct contact is visible on uncoated PEEK.



Examples of PEEK medical devices coated with Titanium



Bibliography

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Image of coated spinal cages on front cover courtesy of Invibio Ltd. Studies in quoted literature were performed using unfilled and reinforced PEEK-OPTIMA® biomaterials supplied by Invibio Ltd.

