EN

LASAK

Intervertebral disc replacement

IMPLASPIN

IMPLASPIN

- Accelerated osseointegration
- Excellent primary stability
- High-strength

CHARACTERISTICS

Osteoconductive implants, developed by the LASAK company, represent a new generation of biomaterials to replace bone tissue. The main characteristics of these implants are the excellent mechanical and significant osteoconductive properties of their surface, which enable faster and better healing of the implant. The implant is manufactured from pure titanium with a chemically treated surface or from Invibio PEEK-OPTIMA™ HA Enhanced with a roughened osteoconductive surface. The osteoconductive surface of the implant enables faster osseointegration without a soft tissue layer and helps to create a fusion between the implant and the bone. This strong fusion between the implant and the bone tissue ensures uniform distribution of stresses on the bone interface and loaded implant, thus preventing local overloading of the bone and subsequent bone resorption. The function of the osteoconductive spinal intervertebral disc is to prevent instability of the affected motion segment of the lumbar or cervical spine.

INDICATION

- Degenerative diseases of lumbar and cervical intervetebral discs
- Spinal cervical injuries

OSTEOCONDUCTIVITY

Implants with an osteoconductive surface, compared to implants of pure titanium or PEEK show greater tolerance to unfavorable conditions for healing, such as a gap between the bone and the implant or primary implant instability.

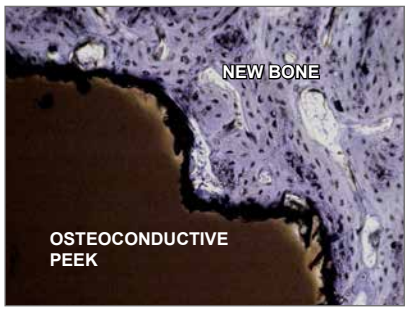
1. Osteoconductive titanium

Histological cross-sections of an implant with an osteoconductive surface and newly formed bone tissue 10 weeks after implantation. (Original magnification 200x, stained with toluidine blue.)

2. Bioinert titanium

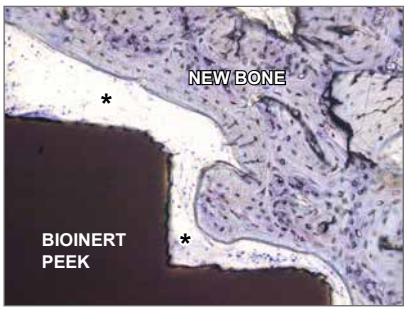
Histological cross-section of a machined surafce titanium implant and newly formed bone tissue 6 weeks after implantation, (* soft tissue). (Original magnification 200x, stained with toluidine blue.)

3. Osteoconductive PEEK



Histological cross-section of an implant from PEEK-OPTIMA™ HA Enhanced with an osteoconductive surface and newly formed bone tissue 6 weeks after implantation. (Original magnification 200x, stained with toluidine blue.)

4. Bioinert PEEK



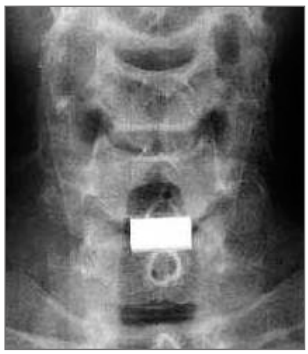
Histological cross-section of an implant PEEK-OPTIMA™ HA Enhanced with a machined surface and newly formed bone tissue 6 weeks after implantation, (* soft tissue). (Original magnification 200x, stained with toluidine blue.)

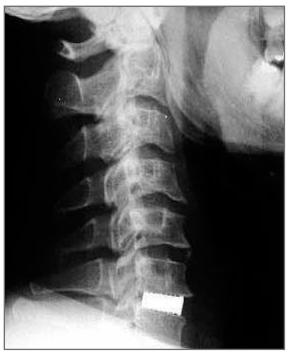
New titanium and PEEK implants with osteoconductive properties showing immediate connection with bone tissue. The healing of the implant with bioinert machined surface is almost exclusively through tissue fibers (*).

APPLICATION

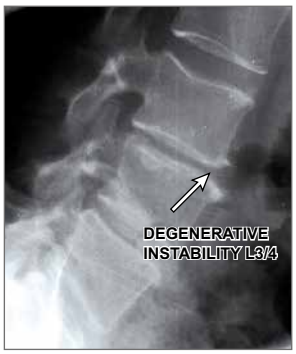
The insertion of the implant is performed with a set of three specially designed instruments. The IMPLASPIN instruments enable the insertion of the implant with minimum damage to the surrounding bone tissue in the vertebral area. The replacement of the lumbar spinal intervertebral disc is achieved by the chosen insertion method: through the spinal canal (PLIF method). The replacement of the cervical intervertebral disc is inserted to the intervertebral space trough the anterior (ACIF method). Very important funcion of the replacement is that the grooves and projections significantly contribute to primary stability of the implant.

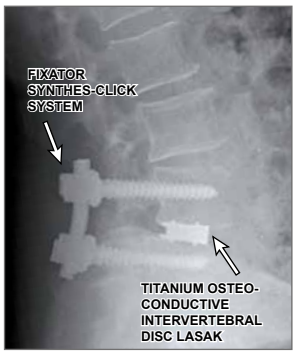
Titanium cervical intervertebral disc IMPLASPIN





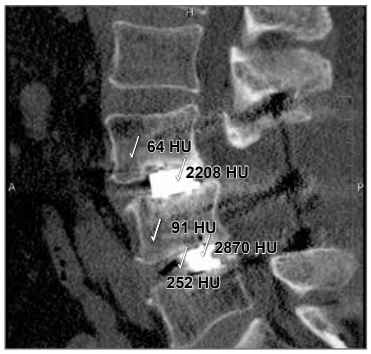
Titanium lumbar spine intervertebral disc IMPLASPIN

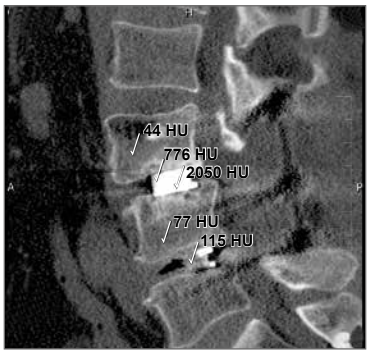


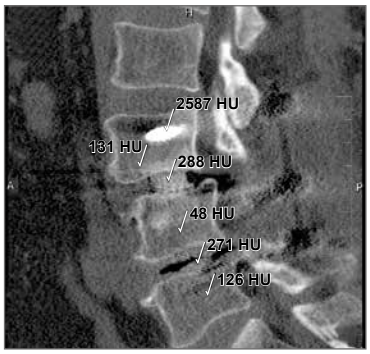


Neurosurgery Clinic – The University Hospital in Ostrava-Poruba, MUDr. M. Filip, Ph.D., MUDr. P. Veselsky, MUDr. T. Palecek
Department of Neurosurgery – Bata Regional Hospital, Zlin, MUDr. M. Filip, Ph.D., MUDr. P. Linzer

DETECTION OF BONE FUSION OF THE INTERVERTEBRAL DISC IMPLASPIN







Implants applied to the space L3/4 and L4/5 alone without addition of bone grafts in combination with transpedicular fixation L3, L4, L5 – displayed by SPECT CT 6 months after surgery. White color – titanium (screws, implant) – measurement in ca 2000 HU. Gray and black – bone (vertebrae, the implant surface) – measurement of 100–300 HU. Clearly visible bone fusion and growth of osteoblasts after insertation of the intervertebral disc (measured in Hounsfield unit).
Department of Neurosurgery – Bata Regional Hospital, Zlin, MUDr. M. Filip, Ph.D., MUDr. P. Linzer
Department of Nuclear Medicine – Hospital in Uherske Hradiste, MUDr. V. Grecman

LITERATURE

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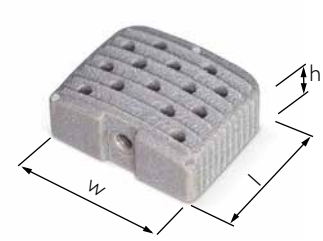
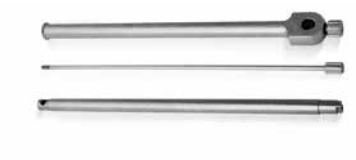


Cervical intervertebral discs (ACIF method)

Specification	Material	Height (mm)	Width (mm)	Length (mm)	Ref. No.
PEEK/H5/W14/L12/3°	OSSEO-PEEK	5	14	12	7006.05
PEEK/H6/W14/L12/3°	OSSEO-PEEK	6	14	12	7006.06
PEEK/H7/W14/L12/3°	OSSEO-PEEK	7	14	12	7006.07
PEEK/H8/W14/L12/3°	OSSEO-PEEK	8	14	12	7006.08
PEEK/H5/W17/L14/3°	OSSEO-PEEK	5	17	14	7005.05
PEEK/H6/W17/L14/3°	OSSEO-PEEK	6	17	14	7005.06
PEEK/H7/W17/L14/3°	OSSEO-PEEK	7	17	14	7005.07
PEEK/H8/W17/L14/3°	OSSEO-PEEK	8	17	14	7005.08

Lumbar intervertebral discs (PLIF method)

Specification	Material	Height (mm)	Width (mm)	Length (mm)	Ref. No.
PEEK/H8/L21/0°	OSSEO-PEEK	8	8	21	7007.08
PEEK/H8/L25/0°	OSSEO-PEEK	8	8	25	7008.08
PEEK/H10/L21/0°	OSSEO-PEEK	10	8	21	7007.10
PEEK/H10/L25/0°	OSSEO-PEEK	10	8	25	7008.10
PEEK/H12/L21/0°	OSSEO-PEEK	12	8	21	7007.12
PEEK/H12/L25/0°	OSSEO-PEEK	12	8	25	7008.12



Instruments

Name	Specification	Ref. No.
Fastening screw	ACIF/PLIF	06070
Insertion tool body	ACIF	06071
Insertion tool body	PLIF	06061
Handle and fixation screw	PLIF	06062
Implant analog	ACIF/H5	06072.05
Implant analog	ACIF/H6	06072.06
Implant analog	ACIF/H7	06072.07
Implant analog	ACIF/H8	06072.08

LASAK s.r.o. • Českobrodská 1047/46 • 190 01 Prague 9 – Hloubětín • Czech Republic
tel.: +420 224 315 663 • fax: +420 224 319 716 • e-mail: info@lasak.com • **www.lasak.com**