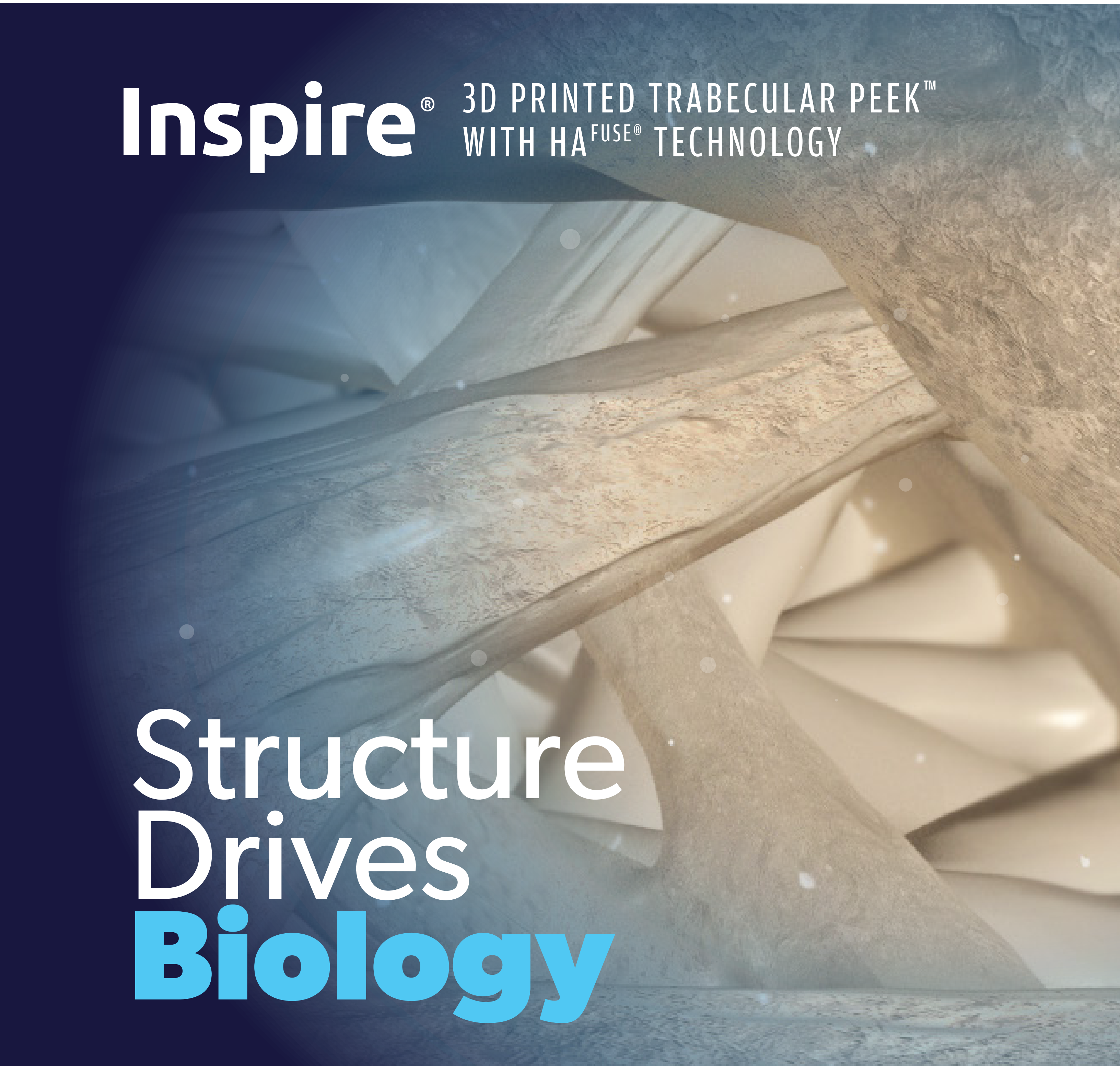
CURITEVA®
POWER TO HEAL

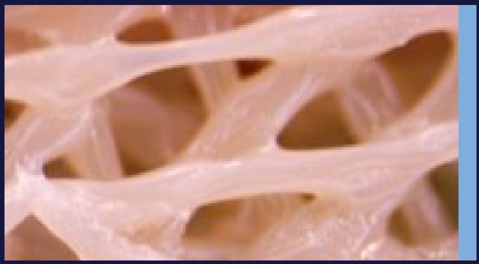


Inspire®

3D PRINTED TRABECULAR PEEK™ WITH HA$^{\text{FUSE}}$® TECHNOLOGY

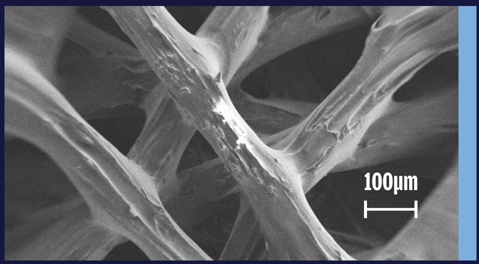
Structure Drives **Biology**

Curiteva pioneered and received FDA Clearance on the world's first 3D printed, fully interconnected porous PEEK structure, utilizing an internally developed Fused Strand Deposition novel process and printer. These proprietary printers create a unique porous scaffolding, resulting in a PEEK structure with superior biomechanical strength compared to traditional PEEK implants.[3,5,6] This unique architecture and capability to print bone-like scaffolding structures, with the addition of the patented HA$^{\text{FUSE}}$ sub-micron surface texture presents hydrophilic surfaces, which can lead to better bone apposition and enhanced Osseointegration, as observed in our animal study.[5]



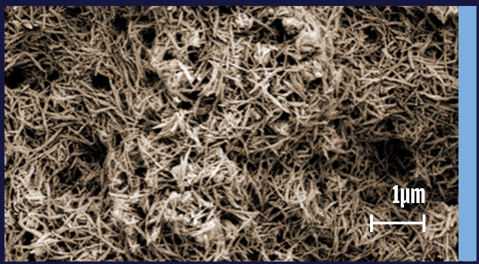
MACRO (40x)

From the macro level the implants pores have a diamond shape architectural design that is intended to mimic human cancellous bone. The pore size distribution of 100 - 600 microns designed to promote Osteoconduction is the starting point to the body's biological response creating the pathway for bone formation.



MICRO (100x)

The micron-scale surface roughness of the extruded strands presents hydrophilic surfaces, which can lead to better bone apposition and integration. This allows the pathway that the macro structure has created to become a nesting area for bone to begin to grow and proliferate.

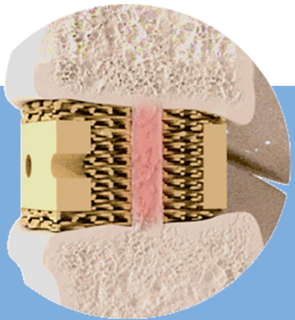


SUB-MICRON SURFACE TEXTURE (40,000x)

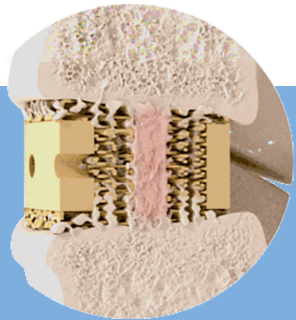
The final step of the process is driven by the layer of Hydroxyapatite that is bonded to 100% of the implant surface throughout the entire structure. Although naked to the human eye, when the body sees these sub-micron (300nm) HA whiskers that are intended to facilitate a near immediate integration of the implant it welcomes it without any inflammatory response. Our animal studies have documented that the absence of the inflammatory response results in strong bone to implant adhesion and zero fibrous layer classically associated with PEEK.

"The presence of bone growth deeply into, and penetration throughout, the implant structure itself has not been previously observed with other PEEK implants."

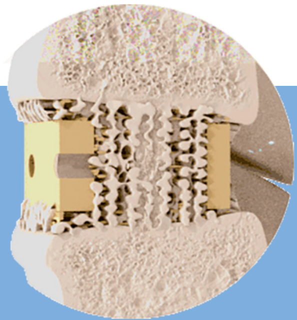
Conclusion of Unique Osseointegration Patterns White Paper - October 2024



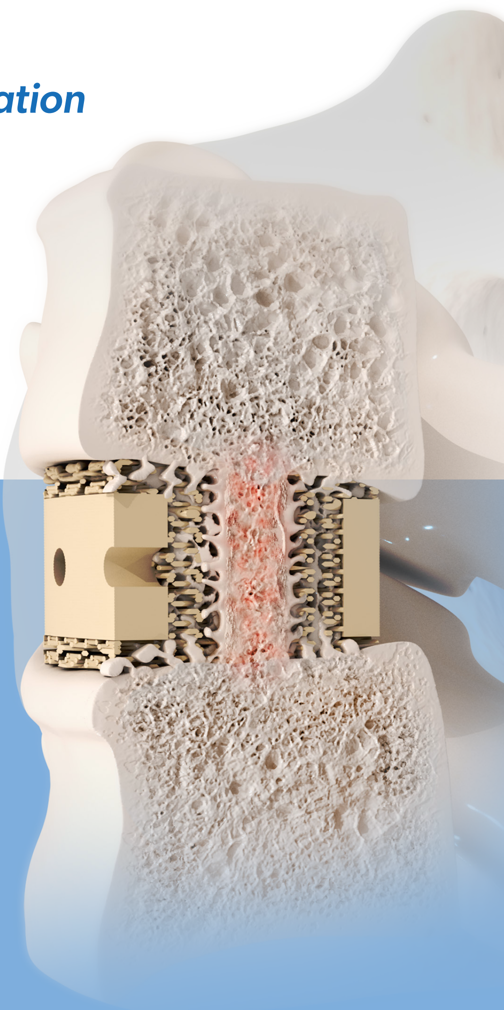
Post Op



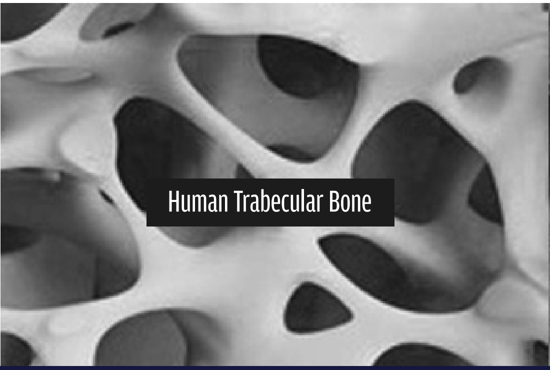
3 Months

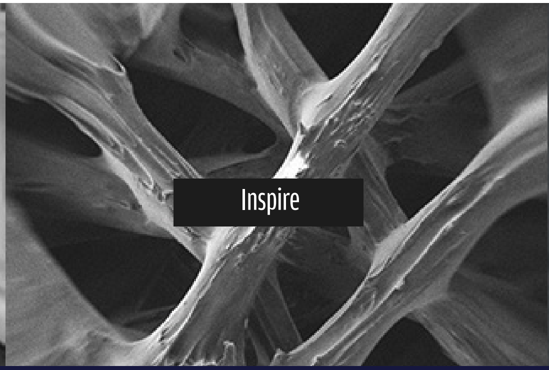


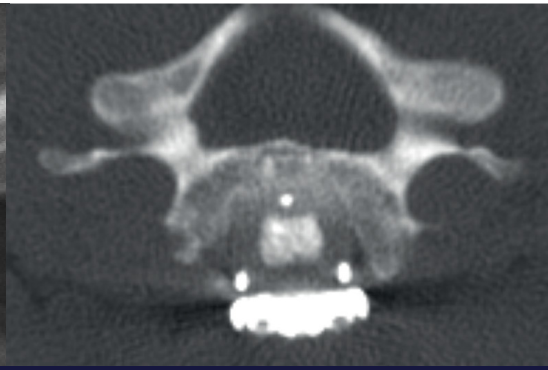
12 Months



Micron-scale surface roughness presents hydrophilic surfaces, which can lead to better bone apposition and enhanced Osseointegration, as observed in our animal study.[5]





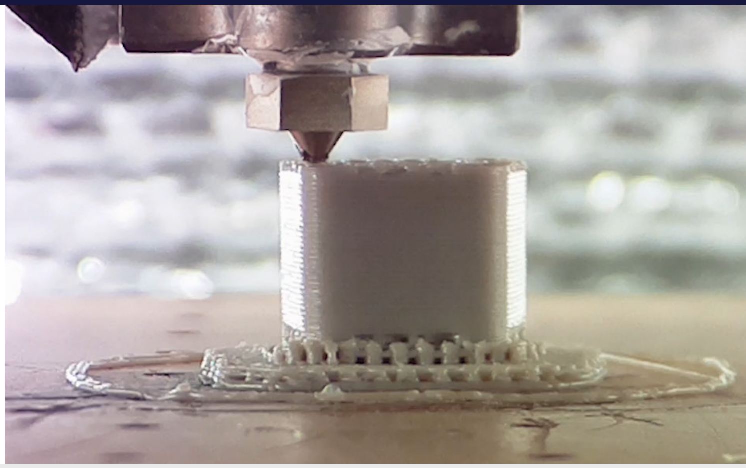


Diamond shape pores (Triply Periodic Minimal Surface, TPMS), documented in literature as possessing superior biomechanic and biologic properties

Ideal radiographic fusion visualization

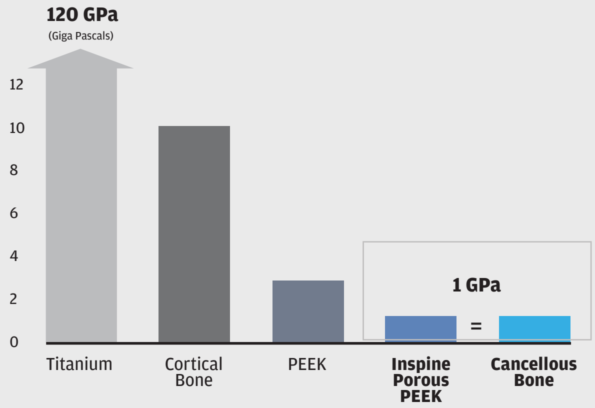
Strength In Architecture

Engineered, Fully Interconnected Porous Structure throughout the implant, enabled by proprietary **Fused Strand Deposition 3D Printer**, designed to mimic natural human bone.



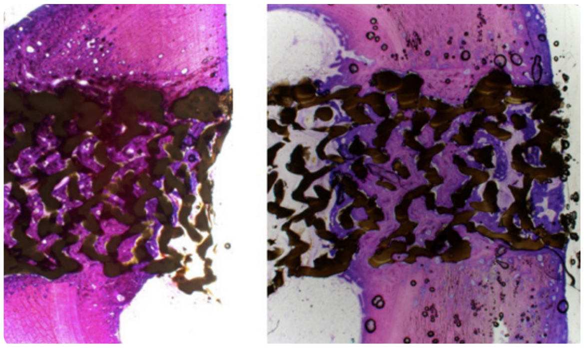
Material Comparison

The flexibility of Inspire lattice architecture is crafted in compliance with Wolff's Law to reduce the overall stiffness and prevent stress shielding by matching the modulus of elasticity of cancellous bone.[2,4]



HA^{FUSE} Promotes Osseointegration

Sub-micron surface texture is designed to help bone anchor directly to the implant surface, creating superior mechanical stability.[2,8] Pre-clinical studies have shown this surface morphology designed to mimic cancellous bone leads to improved Osseointegration as compared to solid PEEK implants.[3,5,6]



12 week Histology Images (ovine)*

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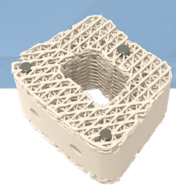

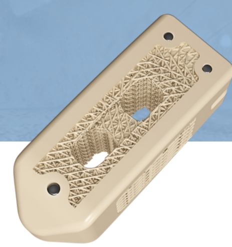

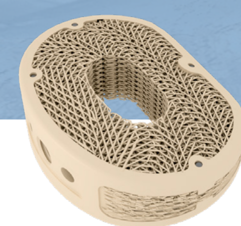

Inspire® C

Anterior Cervical Interbody Fusion System

Heights	5-12mm
Lordosis	7°
Footprints	14W x 12D 16W x 13D 18W x 14D

Inspire® TO

Transforaminal Oblique Interbody Fusion System

Heights	6-16mm
Lordosis	0°, 8°
Footprints	22L x 9W 26L x 9W

Inspire® TA

Transforaminal Anterior Interbody Fusion System

Heights	7-16mm
Lordosis	0°, 8°
Footprints	28L x 9W 32L x 9W

Inspire® A

Anterior Lumbar Interbody Fusion System

Heights	8-20mm
Lordosis	6°, 12°
Footprints	30W x 24D 35W x 26D 40W x 28D

References:
[1] V. Goel, Biomechanical rationale for using polyetheretherketone (PEEK) spacers for lumbar interbody fusion-A finite element study, Spine (2006).
[2] Youngs Modulus comparison of various materials GUM00001 rev A/ VAL 2017-007.
[3] Promimic - Research Monograph, Summary of Preclinical & Clinical Studies -14 published studies (2021).
[4] Wolff J. “The Law of Bone Remodeling”. Berlin Heidelberg New York: Springer, 1986 (translation of the German 1892 edition).
[5] Data is derived from ovine studies. Please note in vitro and in vivo testing may not be representative of clinical experience.
[6] Jimbo, R., Coelho, P.G., Bryington, M., Baldassarri, M., Tovar, N., Currie, F., Hayashi, M., Janal, M.N., Andersson, M., & On, D. (2012). Nano Hydroxyapatite-Coated Implants Improve Bone Nanomechanical Properties. Journal of Dental Research, 91(12), 1172-1177.
[7] Spece, H., Yu, T., Law, A.W., Marcolongo, M., & Kurtz, S.M. (2020). 3D printed porous PEEK created via fused filament fabrication for osteoconductive orthopaedic surfaces. Journal of the Mechanical Behavior of Biomedical Materials.

For more information or to place an order call: 877.9CURITEVA, email: customersupport@curiteva.com or visit www.curiteva.com

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