Porous coating technology using DED 3Dprinting

These are one of our medical application of our coating technology. We used our MPC equipment, developed exclusively for porous coating, to coat several different artificial joint . These artificial joints have been tested and approved by our partners for its quality and excellence! Check the various technical qualities of our technology and MPC machine.

Porous coating for implant [Hip cup, Tibial, Femoral]

MPC

Porous coating for implant

1. Cup component

2. Tibial component

3. Femoral component

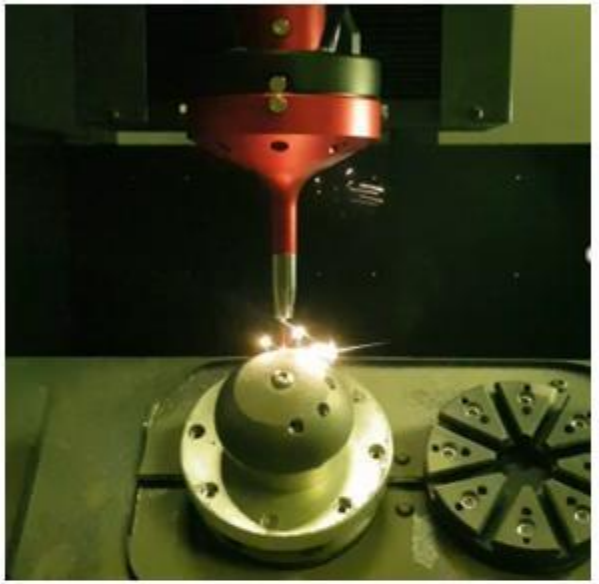
Cup Component (Hip System)

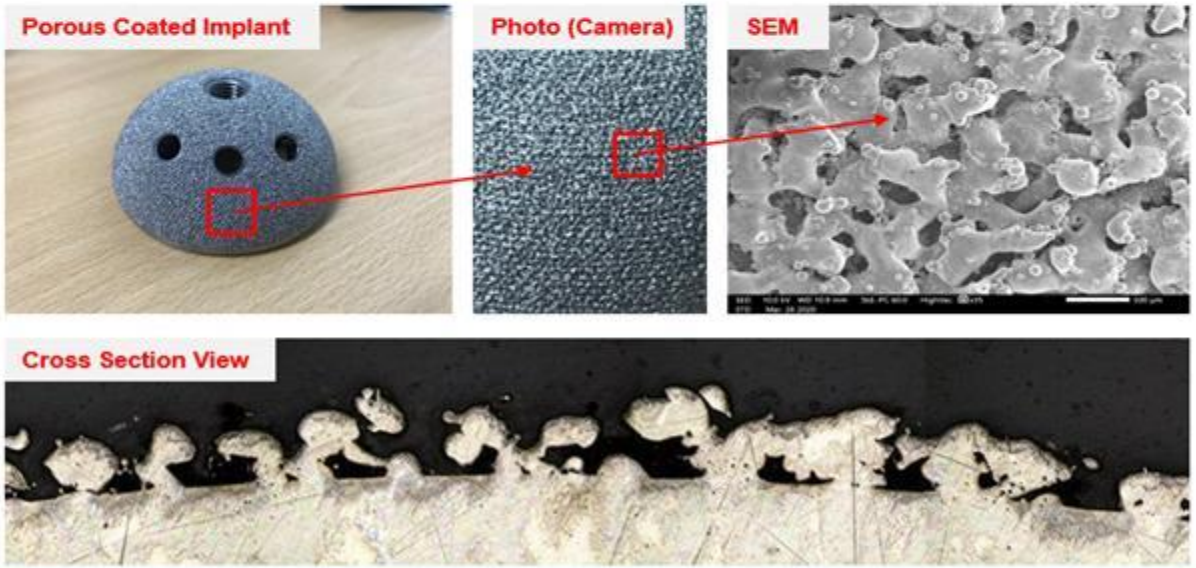
Tibial Component (Knee System)

Femoral Component (Knee System)

Porous Coating for Implant

Porous Coated Implant		
		
Cup Component (Hip System)	Tibial Component (Knee System)	Femoral Component (Knee System)
Pure Titanium (Coating Material)		
Ti-6Al-4V (Base)	CoCr (Base)	CoCr (Base)
	World 1st Titanium Porous Coating on CoCr base	

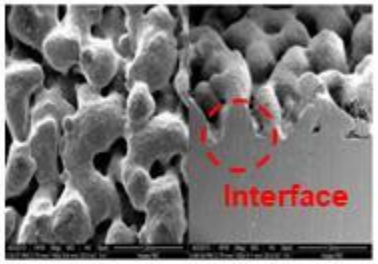




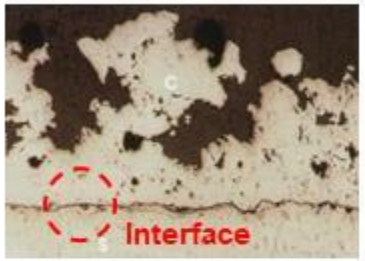
10,000,000 Cycle Success
(Fatigue Test)

Comparison with Other Technologies

- **Comparison between DED / TPS(Thermal Plasma Spray)**



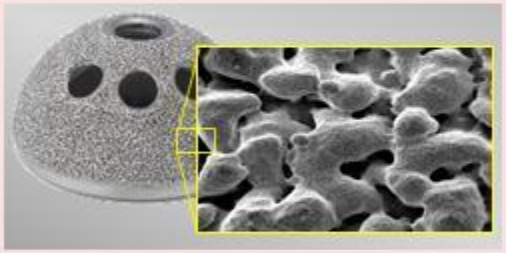
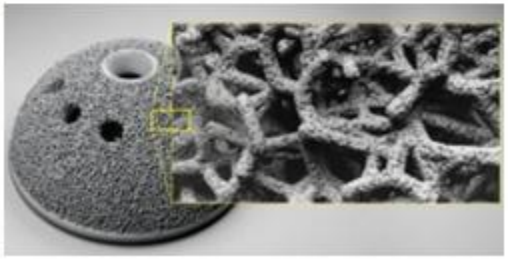
DED Interface



TPS Interface

InssTek Porous Coating Properties			
Thickness(um)	Porosity(%)	Pore size(um)	Struct size(um)
600±120	50.0±10.0	320.0±140.0	370.0±140.0
Tensile Strength(MPa)	**Shear Strength(MPa)**	**Abrasion Loss(mg / 100 cycle)**	
60.5	46.3	40.6	

- **Comparison between DED / PBF(Powder Bed Fusion)**

	Porous Structure	Pros	Cons
DED		• Coating on the machined cups • Short build up time	• Limited cancellous structure
PBF		• Can make cancellous structure	• Low mechanical strength • Expensive process cost • Long build up time

MPC (Machine for Porous Coating)

Group	Specification			
	No.	Item	Specification	Unit
1. Laser	1.1	Type	Ytterbium Fiber Laser	-
	1.2	Laser Power	Max. 300	W
	1.3	Safety Standard	EN60825-1	-
2. Stage	2.1	X, Y, Z Stroke	300 x 300 x 230	mm
	2.2	A, C1, C2 Stroke	-100 ~ +5 / 360 / 360	Deg.
	2.3	Worktable number	2	EA
3. Module	3.1	Optical Module	SPM 200	-
	3.2	Beam Diameter	200	μm
4. Feeding System	4.1	Powder feeding Rate (for Ti6Ai4V)	0.8~6.8	g/min
	4.2	Powder Hopper Volume	Approx. 0.35	liter
	4.3	Number of Powder Feeder and hopper	2	Set
5. Software	5.1	Operating System	Window 7	-
	5.2	HMI Program	MX-OS	-
	5.3	CAM Software	Specialized CAM for MPC	-
	5.4	Feedback System	DMT® Closed-Loop Control	-
6. Electrical Specification	6.1	Electrical Power type	3P+N+PE (at 50-60 Hertz)	-
	6.2	Main machine voltage	380	V
	6.3	Full load current	60	A
7. Mechanical Specification	7.1	Machine Dimensions (without accessories)	1,900 x 1,750 x 2,550	mm
	7.2	Machine Weight	2.7	Ton