www.ossgen.co.kr

OSSGEN Dualpor Collagen PUTTY

ANCHOR TYPE

OssGen

Dualpor Collagen PUTTY Anchor Type **Feature**

Main Features

- Porous calcium phosphate bone graft material with 'Inter-linked Macro/Micro porous structure'
- 60% Hydroxyaptite / 40% β-Tricalcium phosphate. (BCP: Biphasic Calcium phosphate)
- Trabecular structure similar to human cancellous bone and stable bone resorption in the body.
- Blood vessel growth and bone cell migration are possible through the connected macro porous.
- Very high autogenous bone occupancy (about 80% processing rate → 80% autogenous bone occupancy).
- The micro-porous structure on the skeletal surface is very advantageous for bone cell attachment.
- The optimal Scaffold for tissue engineering bone regeneration.
- Excellent biocompatibility.
- Excellent cell formation and adhesion.
- Playback effect.
- Convenience of use. (Free molding)
- Hemostatic effect and anti-adhesion effect.
- Superior bone conductivity and higher autogenous bone occupancy than conventional bone graft materials. (up to 85%)

Raw material &Structure

ISO 13485 **Safe Raw Material**

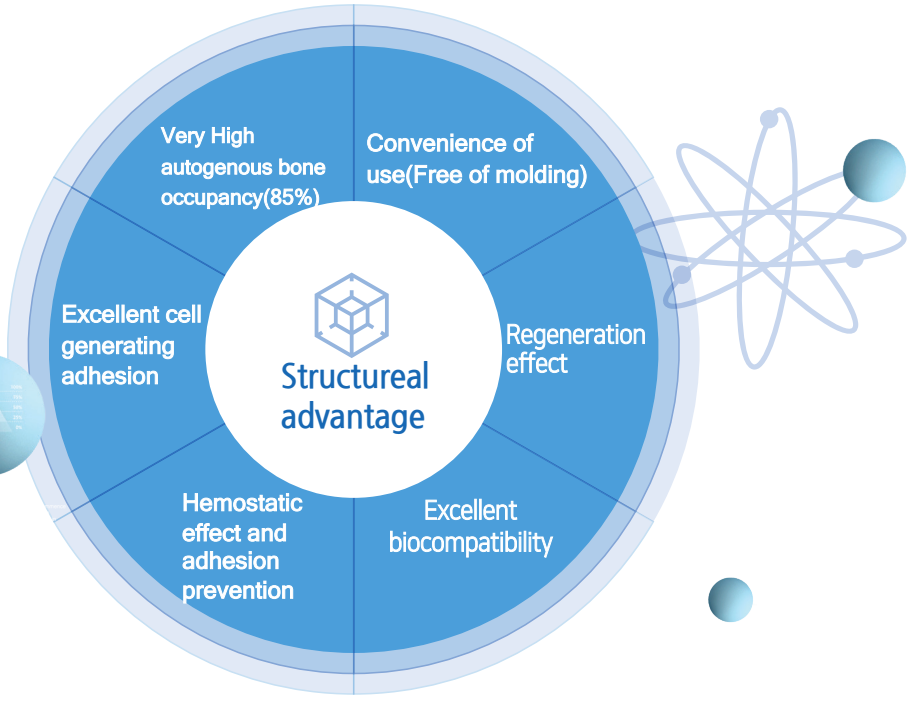
OssGen

Porous Membrane Structure

- Produced in New Zealand where is BSE-free nation
- Extraction from Bovine Amniotic membrane which is under 24 months
- Quality inspection by thorough Quality Assurance

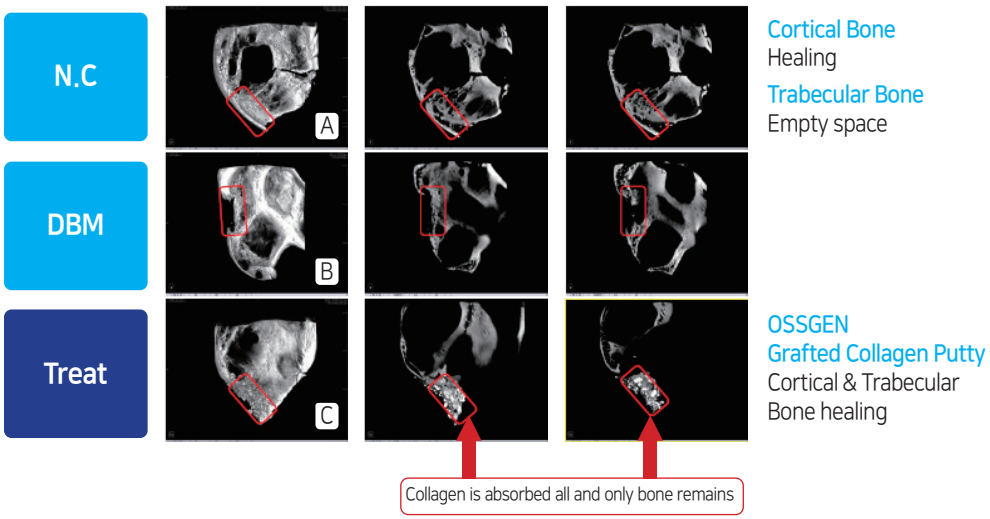
- Production method through ingenious own technology
- White-dense sponge structure
- Easy to store & release drug by porosity membrane

Structural advantage



Specimen (μCT)

Result for 3month specimen-Micro Computed Tomography



| S University Hospital Research Results |

Fig. 1

A The μCT image of specimen with only defect and bone defects is indicated by red box.
B A μCT image of specimen grated DBM on defect and it is indicated by red box.
C A μCT image of specimen grafted collagen putty on defect and it is indicated by red box.

The control group showed a lot of healing in the cortical bone, but there were empty spaces in the trabecular bone. However, the treat group is more healed in cortical and trabecular bone healing than the others.

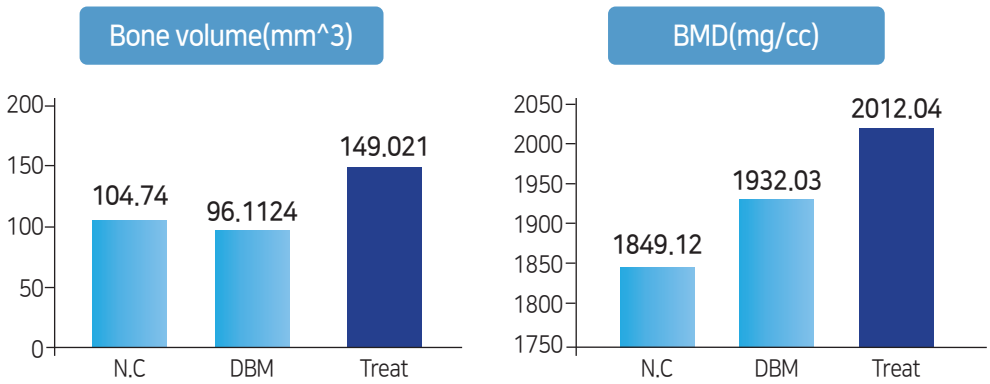


Fig. 2

The following are the Bone Mineral Densito metry(BMD, mg/cc) and bone volume for each sample.

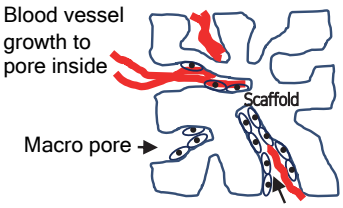
Negative control 1849.12, 104.74
DBM group 2021.04, 149.021
Treat(grafted Collagen putty) 1932.03, 96.1124

	Bone volume(mm^3)	BMD(mg/cc)
N.C	104.74	1849.12
DBM	96.1124	1932.03
Treat	149.021	2021.04

Dualpor Collagen PUTTY
Anchor Type **Character**

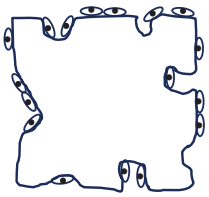
Interconnected Macro/ Micro pore system

OSG DualPor



Osteoblast adhesion on Micro pore surface after osteoblast moves to Simultaneous bone regeneration in pore inside&outside

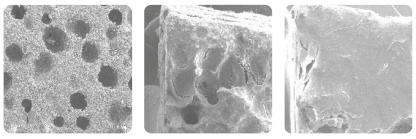
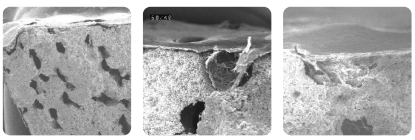
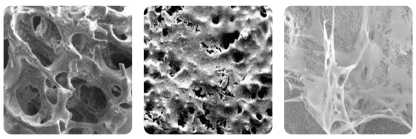
Commercials Products



Cell adhesion on bone graft material outside

Comparison of Commercial Products

Cell culture behavior

A Company (US)	• Osteoblast adhesion only on bone graft material outside by closed pore • No osteoblast in closed pore inside	
B Company (US)	• Osteoblast adhesion only on bone graft material outside by closed pore • No osteoblast in closed pore inside	
OssGen (KR)	• Homogenous osteoblast adhesion along endoskeleton by 'inter-linked' open pore structure • New bone occupancy ratio : **80%**	

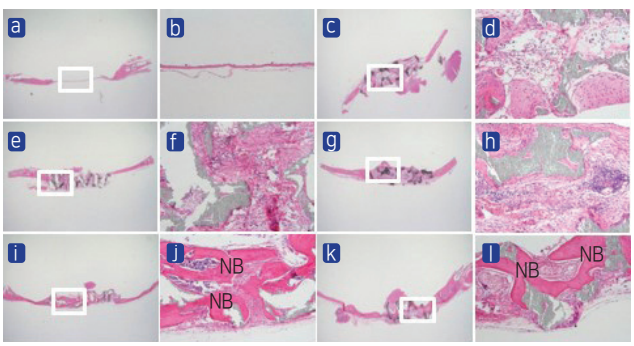
In-vivo Histology

Beagle dog model (6 month)

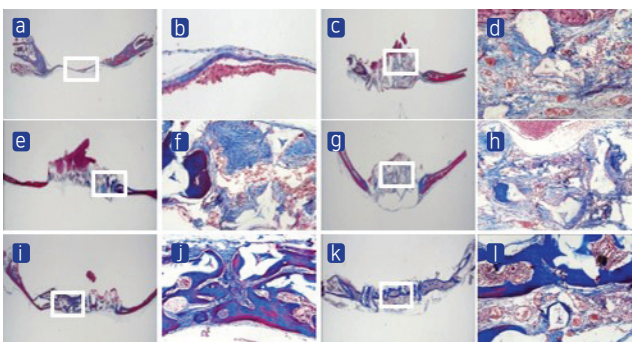
- Old bone (Upper left)
- Bone graft material (Brown color)
- New bone (Blue color)
- Osteoid (Ivory color around bone graft material)
- **80% porosity ratio of bone graft material → 80% autogenous bone occupancy ratio (Higer among domestic and foreign products)**
- Simultaneous &homogeneous bone regeneration of bone graft materail inside &outside through blood vessel growth &osteoblast movement to the inside of Macro/Micro porosity

Collagen Putty Type with Tissue Engineering

Courtesy of Prof. E. Park, KNU



Immunohistochemical analysis of new bone at 10 weeks after surgery
(New bone formaition measured by H&E staining)
(a, b) defect only **(c, d)** BCP only **(e, f)** BCP + ATSC
(g, h) BCP + BMSC **(i, h)** BCP + ATSC + VEGF
(k, l) BCP + BMSC + VEGF ***NB** : New bone



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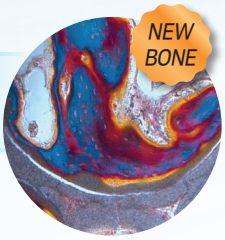
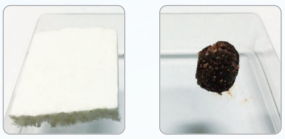
(k, l) BCP + BMSC + VEGF *collagen matrix formation

OSSGEN
Total Solution

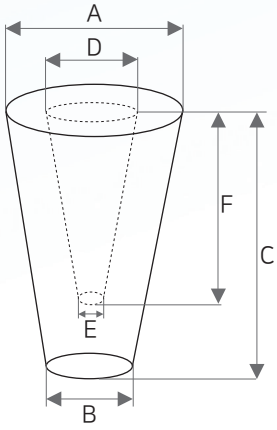
Excellent osseointergration
between bone graft material and
New Bone (Osseointegration)





| Before blood mxing | | After blood mxing |

Structure & Size



Model Name	A Top mm	B Bottom mm	C Height mm	D Top hole mm	E Bottom hole mm	F Hole Height mm	Weight g
Dualpor Collagen Putty H-A	7.2	4	45	3	1	25	0.55
Dualpor Collagen Putty H-B	7.2	4	50	3	1	40	0.59
Dualpor Collagen Putty H-C	8.5	5	45	6	1	25	0.72
Dualpor Collagen Putty H-D	8.5	5	50	6	1	40	0.73
Dualpor Collagen Putty H-E	6	5	40	3	1	25	0.46
Dualpor Collagen Putty H-F	6	5	50	3	1	30	0.57
Dualpor Collagen Putty H-G	7	5.5	40	3.3	1	25	0.59
Dualpor Collagen Putty H-H	7	5.5	50	3.3	1	30	0.75
Dualpor Collagen Putty H-I	6	5	40	3	1	30	0.45
Dualpor Collagen Putty H-J	6	5	50	3	1	30	0.57
Dualpor Collagen Putty H-K	7	5.5	40	3.3	1	30	0.58
Dualpor Collagen Putty H-L	7	5.5	50	3.3	1	30	0.75
Dualpor Collagen Putty H-M	7.2	4	45	3	1	30	0.55
Dualpor Collagen Putty H-N	7.2	4	50	3	1	30	0.61
Dualpor Collagen Putty H-O	8.5	5	45	6	1	30	0.69
Dualpor Collagen Putty H-P	8.5	5	50	6	1	30	0.78
Dualpor Collagen Putty H-Q	6	5	40	3	1	39	0.43
Dualpor Collagen Putty H-R	6	5	50	3	1	49	0.54
Dualpor Collagen Putty H-S	7	5.5	40	3.3	1	39	0.57
Dualpor Collagen Putty H-T	7	5.5	50	3.3	1	49	0.71
Dualpor Collagen Putty H-U	7.2	4	45	3	1	44	0.52
Dualpor Collagen Putty H-V	7.2	4	50	3	1	49	0.58
Dualpor Collagen Putty H-W	8.5	5	45	6	1	44	0.67
Dualpor Collagen Putty H-X	8.5	5	50	6	1	49	0.61

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