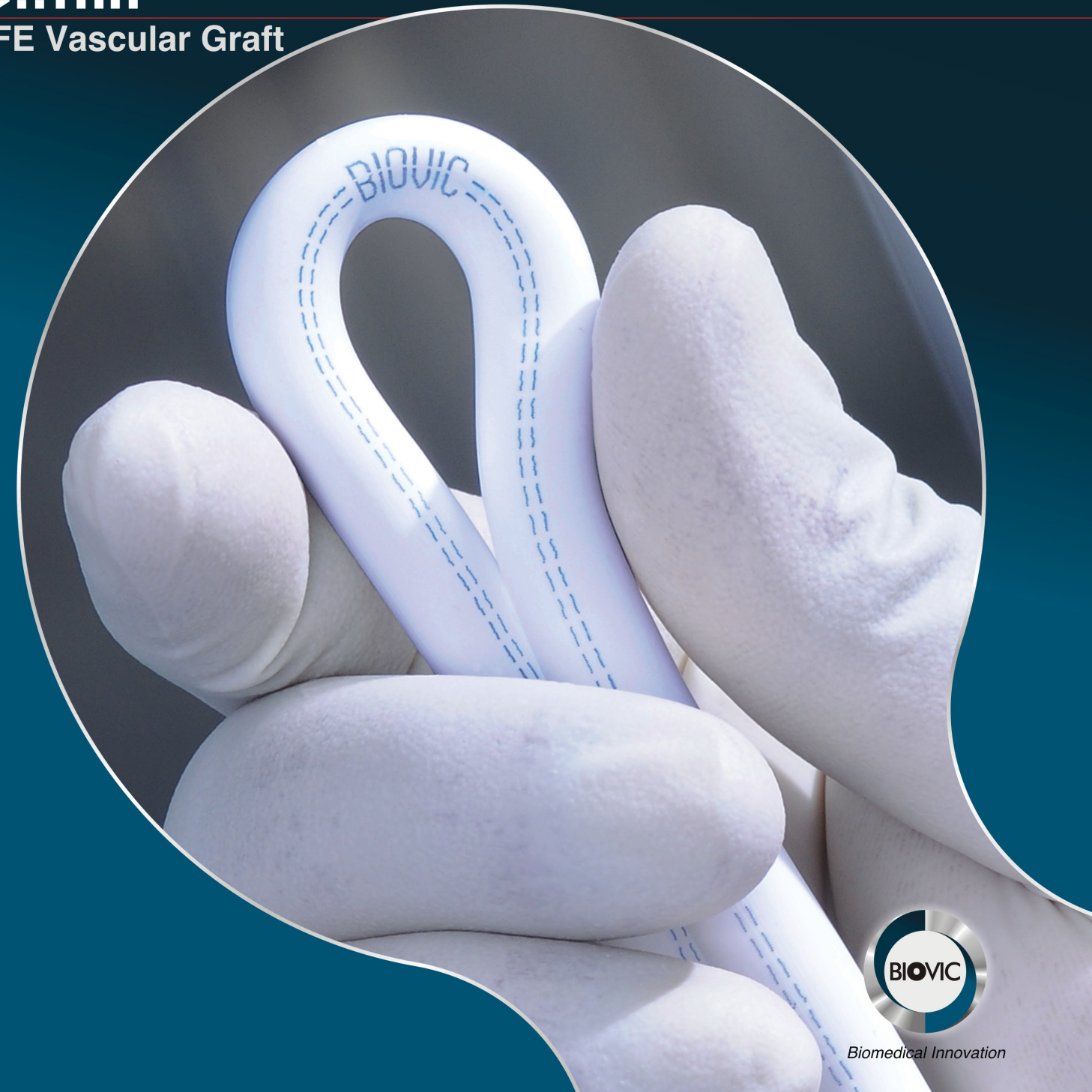


# AVATAR

PTFE Vascular Graft



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Biomedical Innovation

# INDIGENOUSLY DEVELOPED MEDICAL TECHNOLOGY

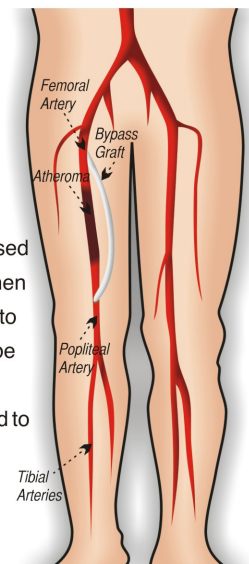
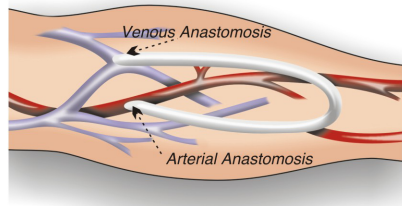
## PTFE BIOMATERIALS: INDEPENDENTLY DESIGNED AND DEVELOPED

BIOVIC Sdn Bhd, located in Kuala Lumpur, Malaysia has independently designed, developed and commercialized PTFE medical technology starting with a complete line of PTFE Vascular Grafts.

AVATAR™ PTFE Vascular grafts are available in a variety of configurations and are made of expanded polytetrafluoroethylene (ePTFE). This is a synthetic, biocompatible microporous material that has a 30 year clinical history as a long term implant. Grafts with a PTFE external spiral support (Helix grafts) are intended for use in applications where kink and crush resistance is required: the Helix support on full length grafts are removable (can be peeled away) whereas centre-Helix graft configurations are permanent. AVATAR™ PTFE vascular grafts are intended for use in arterial vascular reconstruction, segmental bypass, and for arteriovenous vascular access.

### ARTERIOVENOUS GRAFTS

Biovic's AVATAR™ PTFE Grafts may be used for blood access during dialysis as an alternative to either a central venous catheter or native fistula. An example of the graft placed in a looped configuration in the forearm as shown below left:

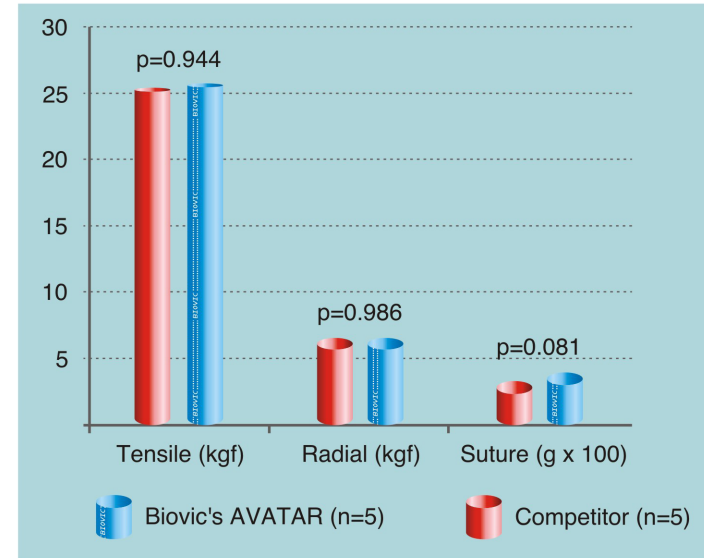


### PERIPHERAL VASCULAR BYPASS GRAFTS

Biovic's AVATAR™ PTFE Grafts may also be used for peripheral vascular or segmental bypass, when autogenous vein is either unavailable, or needs to be saved for another procedure. The graft may be used to bypass atheroma-occluded or diseased arteries thereby providing a supply of fresh blood to an ischemic limb, as indicated in this figure:

## MATERIAL STRENGTH

AVATAR™ PTFE Grafts were compared to Competitive PTFE Vascular Grafts with respect to Tensile, Radial, and Suture Strengths. The results indicated that AVATAR™ PTFE Grafts were of equivalent strength to the Competition:

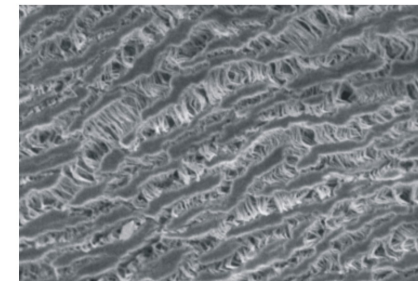


#### PRELIMINARY PRODUCT TYPES:

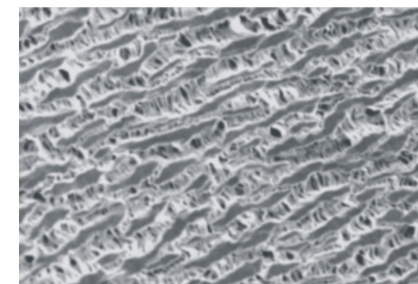
- Diameters ranging from 4mm to 10mm
- Straight Grafts
- Full length Helix Grafts (kink and crush resistance)
- Center Helix Grafts
- Long Tapered Grafts
- Short Tapered Grafts
- Tapered Helix Grafts

## BIOCOMPATIBLE MICROSTRUCTURE

PTFE has been used as a clinical implant material for over 30 years. The microstructure that makes this a successful vascular replacement is a porous structure made up of solid nodes interconnected by fibrils or "tendons." A porosity of about 50-70% has been noted to be conducive to the tissue ingrowth and cellular incorporation that contribute to making the implant function in-vivo. AVATAR™ PTFE Grafts have a microstructure that is virtually identical to that of the competition, ensuring its biocompatibility and capacity to be incorporated by the body. The SEM's below illustrate the similarity.



Competitors Graft Inside Surface 200x magnification



Biovic's AVATAR Graft Inside Surface 200x magnification

## HANDLING AND FEEL

The handling and suturability of the AVATAR™ PTFE Graft have been assessed by Vascular Surgeons familiar with competitive product. The typical response was that the AVATAR™ PTFE Graft "feels and sutures just like any other PTFE graft I have used". This suggests that neither the Surgeon nor the patient will notice a difference - with the exception of the price! BIOVIC AVATAR™ PTFE Grafts are priced below that of the competition. This is because they are manufactured and distributed locally, but to the very same quality standards. Please contact the website overleaf if you are interested in this product and would like more information.

## STATE OF THE ART FACILITY

All BIOVIC products are manufactured in a state of the art production facility with a Class 10,000 (C) clean room.



## CERTIFICATIONS

### BIONEXUS

BIOVIC is recognized by the Malaysian government as an Innovative Medical Device company and thus has achieved BIONEXUS status.



### ISO 13485

BIOVIC has been ISO 13485 certified since 2010.



### CE MARKING

The AVATAR™ PTFE Vascular Graft family is also CE Marked, with compliance to MDD 93/42 /EEC by the German Notified Body, DQS.

