

BROCHURE

*biometric*TM

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REPLICATE NATURAL DYNAMIC CONDITION

IAXSYS™ is a revolutionary tissue-engineering-ready bioreactor system for replication of *in vivo* dynamic conditions. IAXSYS™ facilitates dynamic incubation of:

- *in vitro* & *ex vivo* tissue culture
- cell seeded flexible 3D scaffolds
- cell seeded 2D elastomer membranes
- cyclic wear testing of implant biomaterials

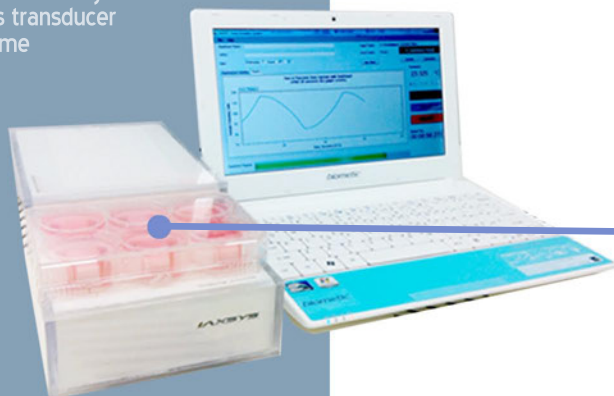
COMPATIBLE & RELIABLE

The IAXSYS™ platform is fully compatible with established aseptic cell culture techniques, culture plates, and incubators. This ensures practicality and familiarity for users along with reliable assays free of contamination and infection associated with conventional bioreactors.

ACTUATION CAPABILITIES

- Induce strain (up to 15 mm) in tension, compression, biaxial, flexion
- Cyclic (up to 3Hz) or linear quasi-static
- Variety of waveforms, active/rest periods
- 6/12 Well Plates: 3D/2D scaffolds, gels, tissues

The IAXSYS™ connects via USB to a PC controller. Software logs data and plots transducer channels vs time

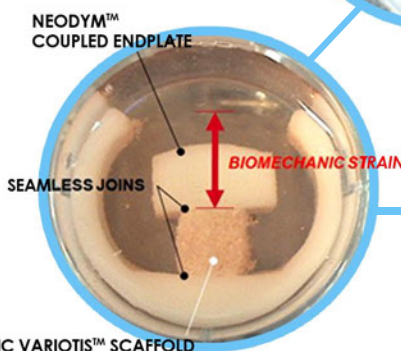


NEURALNET™ interface allows adjustments of actuation for tissue and scaffold changes

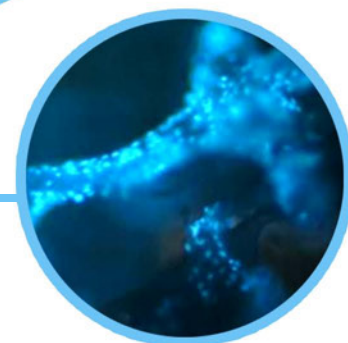


The NEODYM™ magnetic interlock ensures a sterile barrier during actuation while isolating magnetic flux from cells

MOVEMENT IS KEY to tissue engineering systems and understanding: cartilage, chronic wounds, microbiology, and even cancer. Shear force induced by fluid turbulence at the cellular level through to macroscopic strain have been shown to have pronounced effects on living systems and their regulatory mechanisms.



ELASTOMERIC VARIOTIS™ SCAFFOLD



Chondrocyte cell proliferation on VARIOTIS™ scaffold subject to physiologic strain

WELL INSERTS

Sterile single-use well inserts ensure reliable assays. A ring portion ensures one scaffold end remains fixed to the cell well while the other portion translates to induce compression or tension. Insert configurations are available that allow biaxial dilation and flexion. A variety of endplate connections methods are available to suit different scaffold /tissue types.

EASY SETUP & CLEANING

The IAXSYS™ sits on an incubator shelf with ease. The removable chassis allows the sealable case to be washed and disinfected separate from electronics.

variotis™

By culturing cells in 3D, the IAXSYS™ system is able to support a higher cell yield with near-physiologic signalling. The 3D variotis™ scaffold is a versatile bioactive-bioabsorbable system comprised of a polyester-based composite used to enhance cell attachment and proliferation. The tissue conductive portion is highly interconnected and porous (>95%), making it highly permeable for optimum fluid flow, while still retaining shape, volume and attaining exceptional tear strength and failure strain.

The unique design of the variotis™ core allows for conduction of both soft and hard tissue followed by gradual resorption without causing adverse reactions, large shifts in pH or fibrous encapsulation.

A range of post-culture analytical techniques can be subsequently conducted given its relative ease of manipulation.

The variotis™ scaffolds, membranes and inserts can be readily bonded by applying gentle heat for stable fixation during actuation. Alternatively, Biometric's xkin™ biocompatible adhesive can be applied to both variotis™ and other synthetic scaffolds to provide customisable dynamic tissue engineering constructs. Xkin™ can additionally be used to create a 2D cell-culture membrane, where cell attachment and proliferation can be further enhanced with a bioglass coating. Tissue adhesive is available for the bonding of biologic scaffolds or *ex vivo* tissues to endplates.

Biometric's varloset™ kit allows customisation of variotis™ scaffolds to suit specific requirements. Scaffold thickness, porosity and pore-gradient can be tailored to particular cell or tissue assays.

bioglass™

Bioglass is one of the few biomaterials that readily facilitates both soft and hard tissue attachment. The bioactive hydrated silica layer that forms at the interface supports cell-matrix adhesion, tissue ingrowth and long term conduction.

Bioglass may also be used to induce radio-opacity as a tag, coating or filler for gels, polymers and polymer textiles.

45S5 bioactive glass composition is currently available in two forms:

- Granules
- Powder (50µm diameter)

Custom formulations are also available upon request.
(All bioglass is research grade only - not for human clinical use).



ADVANCED TESTING & ANALYSIS

Biometric offers a wide range of testing and consulting services for medical devices, biomaterials, biomechanics, and biologicals.

Biometric's platform technologies can also be tailored to individual research work.

For further details, please contact a Biometric consultant at info@biometric.com.au

TESTING EQUIPMENT EXPERTISE

- Uniaxial/Bending (Instron)
- Axial Torsion Tester (Bose ELF3400)
- Cyclic/Fatigue (MTS810)
- Infrared Motion Capture (Certus)
- Nanomechanics (Hysitron)
- 6-Axis Biomechanics Tester (Bose)

ABOUT US

Biometric develops and manufactures innovative biotechnology products that are platforms for a range of cutting-edge cell- and tissue culture research applications. Our versatile technology, inspired by nature's biosystems, replicates optimized form, designs and functionality to suit research requirements.

As part of an ongoing collaborative and interdisciplinary development program with leading research centres, Biometric's core technologies are at the forefront of medical research discovery and implant development. Areas of active collaborative research include implant engineering, orthopaedics, sports medicine, oncology, odontology, skin, cartilage and lung tissue engineering.

As an ISO-aligned OEM, Biometric designs and develops products by exhaustively capturing and tracking user safety and regulatory requirements through to rigorous testing. Our team is committed to good laboratory, manufacturing and business practice to attain quality of product and service that exceeds customer expectations. We look forward to hearing from you.

COLLABORATIONS

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