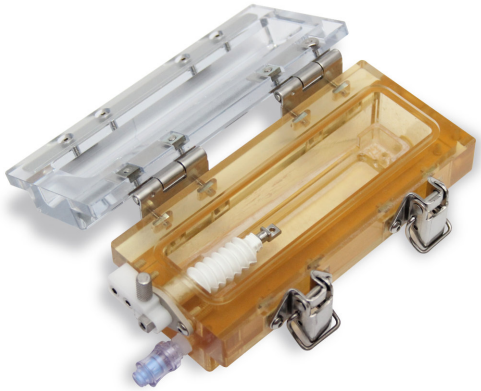
DermiGen | Tension Compression Bioreactor System

Skin epidermal cells as well as those of the respiratory system are constantly exposed to air due to their location in the body. Thus, for health-risk assessment it is important to characterize the response of these cells to cosmetics, tobacco products etc. in an air-liquid interface (ALI) culture. Along with exposure to the elements these cells are also subject to mechanical strains during respiration as well as in motor movement. Instron-TGT provides a complete solution for tissue culture and testing in ALI through DermiGen Tension Compression System. The system is equipped with a bioreactor capable of cell/tissue culture at ALI and a mechanical stimulator for static as well oscillatory load application. DermiGen is ideal for Pharma, contract research organizations, tobacco industry and those working on cosmetic testing. The system is also aimed at research labs working on developing artificial skin models for in-vitro toxicity testing as well as labs working in respiratory biology.

Bioreactor

- Fabricated from bioinert material, fully autoclavable and UV sterilization compatible
- Unique design allows cell culture in air-liquid interface while maintaining sterility. Media perfusion from bottom prevents shear-damage to construct growing in ALI
- Chamber allows adequate media volume to enable long-term culture and testing
- Ports can also be used for connecting temperature/CO2/pH sensors based on user requirement

Chamber details – Sample length 45-70mm, Width 20mm, Thickness 0.1-2mm



DermiGen Bioreactor Chamber

Grip Options

DermiGen grips are fabricated from biocompatible materials and are fully autoclavable as well as UV sterilizable. Multiple grip options are available for testing of varied samples.

- Mechanical grips with screw locking for tensile testing prevents lateral movement of sample in liquid media.
- Sample height adjustment at air-liquid interface possible to optimize media volume
- Grips with soft surface to prevent damage to the sample while still maintaining grip
- Flat platens for compression/confined compression of hydrogels / constructs
- Custom grips for specific construct geometries and textures available

Mechanical Stimulator

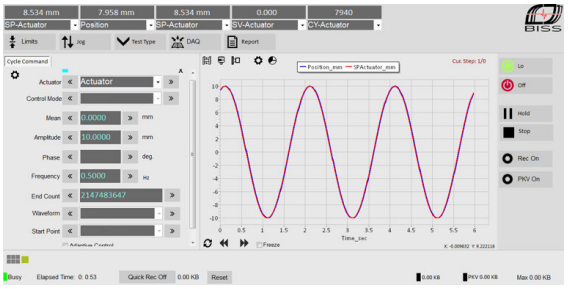
DermiGen system is equipped with a 40 N actuator capable of applying precision loads.

- System can be operated in load and displacement control modes
- Can be used for static and dynamic testing
- Lightweight, corrosion-resistant and unique compact design allows placement inside any standard incubator for long-term culture experiments

Control System and 'Growthworks' Software

Simple, adaptable and modular GrowthWorks Package provides an ideal control for tissue testing and culture.

- Controller configuration allows for multi-station configuration with multiple actuators working in tandem
- Real time visualization of load displacement data and single click report generation for analysis.
- Software allows for static testing as well as dynamic testing with preloaded waveforms. Custom waveforms can also be set according to user requirements.



Perfusion Module

For long term experiments requiring supply of fresh medium, Instron TGT provides a unique perfusion module integrated with the DermiGen system. This optional module is designed to provide convective media flow around the sample under user defined conditions.

Tests Possible with DermiGen tension compression bioreactor system

- Uniaxial Tension
- Uniaxial Compression
- Stress Relaxation
- Creep

This is a list of most commonly used tests. Please contact our product specialists for inquiries about specialized testing applications. They will be happy to help you find the best solution to further your research and development goals with Instron TGT products.