

TC-3F load bioreactor

Description

The TC-3F Bioreactor has been designed as a simple easy-to-use system suitable to create cell culture experimental setups applying mechanical loading profiles defined by the user to the samples.

Moreover than providing the mechanical loading conditions, the TC-3F allows measuring the force which is applied on the sample while subjected to the desired deformation cycle.



Applications

Thanks to its force measurement capabilities, the TC-3F allows developing **material characterization test** as well as to **measure the force which is being applied on the sample** at each moment.

From the substrate point of view, the TC-3F offers the same possibilities that the TC-3 system:

- Horizontally and vertically arranged multiple samples,
- Immersed and air-liquid interface setups,
- Sheet-shaped, rod-shaped and cylinder-shaped substrates and
- Tension and compression axial loading

Visual inspection of the samples is provided thanks to its transparent lid and bottom glass window. Also when working with thin membrane-shaped scaffolds, it is possible to use **microscopy techniques to inspect the status of the culture in-situ**.

Scalability and versatility are key features of the TC-3F, in which three grips models can be interchanged in order to adapt to the features of the testing substrate or scaffold.

The system is controlled by a simple computer interface which allows defining the most common loading profiles which can be applied on the culture substrate.

TC-3F mechanical stimulation bioreactor

Actuation system	
Dimensions [W x D x H]	<ul style="list-style-type: none"> Vertical configuration: 280 x 300 x 492 mm Horizontal configuration: 280 x 492 x 70 mm
Number of chambers	Up to three
Minimal displacement increment	0.005 mm
Maximal force	200 N
Control	PC-based control software
Power supply and consumption	110-220 V, 50-60 Hz, IEC 14 power cord
Maximal deformation rate	10 mm/s
Chambers	
Autoclavable	Yes
External Dimensions [W x D xH]	78 x 137 x 51 mm
Internal Dimensions [W x D xH]	38 x 75 x 32 mm
Maximal internal volume [*]	~ 90 ml
Rod-like grips	
Autoclavable	Yes
Useful width	30 mm
Maximal displacement	22.5 mm
Minimal displacement	0.5 mm
Compression grips	
Autoclavable	Yes
Useful diameter	22 mm
Maximal displacement	22.5 mm
Minimal displacement	0.5 mm
Load cells	
LC50	Force range: 0-50 [N]
LC100	Force range: 0-100 [N]
LC200	Force range: 0-200 [N]

[*]: This value is calculated without subtracting the volume occupied by the grips and the sealing bellow and considering that the chamber is filled to its full capacity. In a real experiment the culture media volume needed to fully cover the scaffold can be drastically smaller depending on the type of scaffold and the working configuration of the actuation system.