

TRYTON™

AUTOCLAVABLE BIOREACTORS

INDUSTRIAL SERIES – 1L TO 18L W/V

Innovative Solutions and Process Support



dcι·biolafitte
The BioLogical Choice™

600 North 54 Avenue
P.O. Box 1227
St. Cloud, MN 56302-1227
Phone: (320) 257-4378
Fax: (320) 252-0866
Email: info@dcι-bio.com

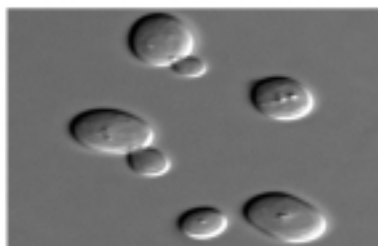
EXPERIENCE & INNOVATION

Utilizing its expertise in industrial bioprocesses and automated systems, DCI - BIOLAFITTE introduces its TRYTON™ series, a new generation of autoclavable bioreactors that represent a state of the art answer to the evolution in the field of biotechnology.

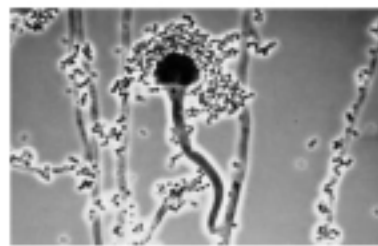
The non-proprietary control based technology common to the entire range of DCI - BIOLAFITTE Bioreactors offers a scalable solution. This scalable solution is suitable for research and development in the laboratory to GMP manufacturing and industrial applications.



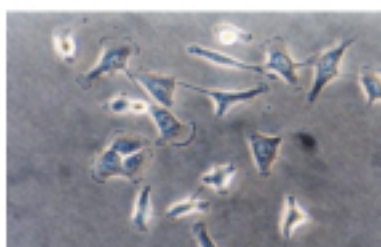
MICROBIAL CULTURE



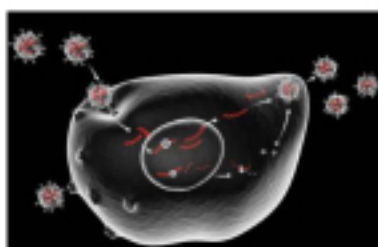
YEAST CULTURE



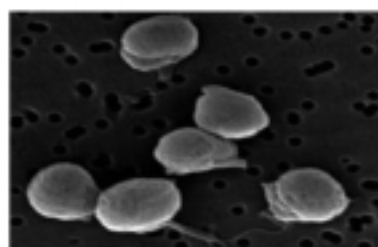
FILAMENTOUS FUNGI CULTURE



MAMMALIAN CELL CULTURE



VIRUS AMPLIFICATION



MICRO-ALGAE CULTURE

BENEFITS

- Ergonomic, modular and compact system
- Six standard interchangeable vessels, from 1 to 18 L w/v for fermentation or cell culture, plus custom vessels on request
- NEPTUNE™ Control system with user friendly and intuitive interface (17" Touch screen PANEL PC) suitable for Research & Development or small scale production in GLP / GMP environments
- Micro-PLC – PC based Control technology ensuring robustness and reliability to the system
- Software developed from non-proprietary platforms complying with GMP requirements (21 CFR PART 11 and GAMP 5 (*))
- Easy installation and maintenance
- Remote supervision of multiple bioreactors via ETHERNET™ network

(*)) With the SCADA iFIX or InTouch versions

QUALITY PROGRAM AND QUALIFICATION

- Full system testing (client invited to attend)
- Rigorous quality program including comprehensive tests for problem-free start-up
- Optional extended test program and documentation package (FS, HDS, SDS, FAT / SAT protocols) designed to support and ease qualification

TRYTON™

TECHNICAL SPECIFICATIONS

VESSEL, AGITATION & ACCESSORIES SPECIFICATIONS

VESSEL

- Vessel fitted with removable head plate - Available sizes : 1, 2, 3, 5, 10 & 18L w/v – Working aspect ratio 2:1
- Material and finish: borosilicate glass vessel, EN 14404 (316L) Ra ≤ 30 stainless steel head plate
- Heating via electrical blanket - optional internal coil or jacketed vessel for heating and cooling

AGITATION

- Agitator fitted with two RUSHTON-PG turbines (microbial culture) and one marine or HTPG2 impeller (cell culture)
- Mechanical coupling (with multiple seal) or magnetic coupling
- Adjustable speed 40 to 1500 RPM (microbial culture) or 10 to 400 RPM (cell culture)
- Two removable baffles

ACCESSORIES

- Gas inlet with 0,2 µm absolute filter, aeration tube (microbial culture) or 50 µm stainless steel mesh sparger (cell culture)
- Gas outlet with 0,2 µm disposable filter and condenser
- Inoculation tube for sterile addition
- Harvest and sampling devices (closed systems)
- Triple inlet port fitting for reagent additions (Alkali, acid, antifoam...)
- Novel septum port for sterile addition
- High/low flask holders for bottle addition kit (4 flasks per vessel)

Code	Culture type	Vessel 1	Vessel 2
C	Cell culture		
F	Microbial culture		
Code	Vessel Volume (Working/Total)	Vessel 1	Vessel 2
A1	0.8 L / 1.0 L		
A2	2.0 L / 2.6 L		
A3	3.0 L / 4.5 L		
A5	5.0 L / 6.5 L		
A10	10.0 L / 12.4 L		
A18	18.0 L / 22.0 L		
Code	Vessel Configuration	Vessel 1	Vessel 2
01A	Vessel with electrical blanket		
01B	Vessel with internal coil		
01C	Jacketed vessel		
02A	Agitation with mechanical coupling		
02B	Agitation with magnetic coupling		
03	Spin filter for perfusion cell culture application		
04	Flask holder (2 flasks / holder – max 2 holders / vessel) – Qty:		
05	Sterile sample device (including filter and accessories)		
06	Exhaust gas condenser		



INSTRUMENTATION

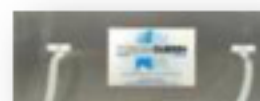
- Ports for standard 12 mm probes and sensors (pH, Redox, pO₂, Optical density, antifoam, level measurement...)
- Thermo well for temperature probe

Code	Instrumentation Configuration	Vessel 1	Vessel 2
10	Temperature measurement and control		
11	Agitation speed measurement and control		
12	pH and Redox measurement and control		
13	pO ₂ measurement and control		
14	Foam level control		
15	Continuous level measurement		
16	Vessel weight measurement (Scale)		
17	Optical density measurement		
18	O ₂ , CO ₂ exhaust gas analyzer		
19	pCO ₂ measurement and control		



TEMPERATURE CONTROL MODULE

Code	Configuration of the Temperature Control Module	Vessel 1	Vessel 2
50	Heating & cooling temperature control module to combined with Coil or jacket		



TRYTON™

TECHNICAL SPECIFICATIONS

PUMP MODULE

- Up to four fixed speed peristaltic pumps per vessel
- One variable speed peristaltic pumps per vessel for fed-batch, continuous culture or perfusions

Code	Pump module configuration		Vessel 1	Vessel 2
40	Fixed speed peristaltic pump N°1	Alkali addition		
41	Fixed speed peristaltic pump N°2	Acid addition		
42	Fixed speed peristaltic pump N°3	Antifoam addition		
43	Fixed speed peristaltic pump N°4	Inoculation / nutrient addition		
44	Variable speed peristaltic pump N°5	Fed-Batch / perfusion		



GAS MODULE

- Maximum of 4 gas addition (air, O₂, N₂, CO₂) to the overlay with rotameter or mass flow controller
- Maximum of 4 gas addition (air, O₂, N₂, CO₂) to the sparger with rotameter or mass flow controller

Code	Gas Module Configuration		Vessel 1	Vessel 2
30Rs	Air line with rotameter and solenoid valve	Sparger		
30Ro	Air line with rotameter and solenoid valve	Overlay		
30Ms	Air line with mass flow controller and solenoid valve	Sparger		
30Mo	Air line with mass flow controller and solenoid valve	Overlay		
31Rs	O ₂ line with rotameter and solenoid valve	Sparger		
31Ro	O ₂ line with rotameter and solenoid valve	Overlay		
31Ms	O ₂ line with mass flow controller and solenoid valve	Sparger		
31Mo	O ₂ line with mass flow controller and solenoid valve	Overlay		
32Rs	N ₂ line with rotameter and solenoid valve	Sparger		
32Ro	N ₂ line with rotameter and solenoid valve	Overlay		
32Ms	N ₂ line with mass flow controller and solenoid valve	Sparger		
32Mo	N ₂ line with mass flow controller and solenoid valve	Overlay		
33Rs	CO ₂ line with rotameter and solenoid valve	Sparger		
33Ro	CO ₂ line with rotameter and solenoid valve	Overlay		
33Ms	CO ₂ line with mass flow controller and solenoid valve	Sparger		
33Mo	CO ₂ line with mass flow controller and solenoid valve	Overlay		



NEPTUNE™ CONTROL SYSTEM

HARDWARE CONFIGURATION

- Micro-PLC / PC based control technology with unique 17" touch-screen PANEL PC Human Machine Interface – Laptop or Desk PC with keyboard and mouse on request
- Up to 16 configurable control loops for a wide range of process parameters including temperature, pH, Redox, speed control, pO₂, foam, gas flow rates, weight or level, OD, pCO₂ on gas exhaust
- Control types include : PID, digital on/off and others – cascade mode for advanced control strategies

SOFTWARE CONFIGURATION

"Advanced" Version

- Customized User Access module complying with 21CFR PART11 (*)
- Synoptic overview presenting all on-line measured values, actuator status, phase running, alarms
- Parameter Editing module allowing operator for adjusting set-points, PID settings...
- Audit Trail module (IFIX or In Touch versions) capturing all actions made with the software and providing a query SQL database record of a batch with customised report generation
- Trend module allowing data display in the form of trends or historic graphs
- Profile module for controlling set-points via imported or plotted data

"Expert" Version

- Calculation module providing a means to make automatic calculations (RQ, OUR...) in real-time; calculated values can then be logged or implemented as a new process control variable.
- Strategy module enabling a process to be defined stepwise for process customization and repeatability, typically used for feed control, complex gassing addition, set-point ramps or event based actions.
- Additional features such as secure SCADA Server (networked system), remote supervision and maintenance on request

(*) With the SCADA iFIX or InTouch versions

Code	SCADA Configuration	Selection
60La	NEPTUNE LAB in "Advanced" version	
60Le	NEPTUNE LAB in "Expert" version	
60Fa	NEPTUNE SCADA iFIX in "Advanced" version	
60Fe	NEPTUNE SCADA iFIX in "Expert" version	
60Ta	NEPTUNE SCADA InTouch in "Advanced" version	
60Te	NEPTUNE SCADA InTouch in "Expert" version	

