

# **EVO™ Series**

# **STEAM IN PLACE FERMENTORS**

## **10L TO 20L W/V**

## **Innovative Solutions and Support**

---



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

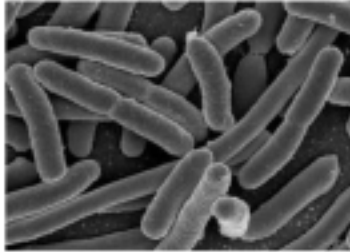
# EVO™ FERMENTORS

## FOR BIOPROCESS RESEARCH & DEVELOPMENT APPLICATIONS

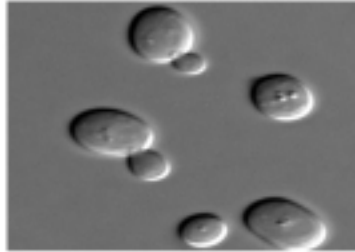
### EXPERIENCE & INNOVATION

Utilizing its expertise in industrial bioprocesses and automated systems, DCI - BIOLAFITTE offers its EVO™ series, a new generation of cost optimized and easy-to-use Steam In Place fermentors dedicated to Research & Development and small scale manufacturing areas in GLP environments.

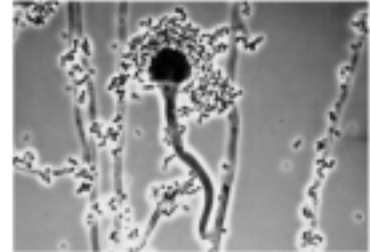
The systems are designed for quick delivery, easy installation and are suitable for many culture types including yeast, bacteria, fungi in batch, fed-batch or continuous modes (with appropriate accessories).



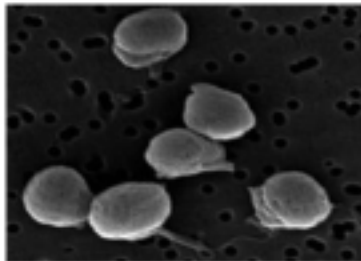
**BACTERIAL CULTURE**



**YEAST CULTURE**



**MYCELIUM CULTURE**



**MICRO-ALGAE CULTURE**

### BENEFITS

- Ergonomic, modular and compact systems allowing easy installation and maintenance
- Bench top or free-standing variants both pre-mounted and pre-wired, allowing easy installation and maintenance
- NEPTUNE™ control system with user friendly and intuitive interface suitable for Research & Development or small scale production in GLP environment
- Micro-PLC – PC based Control technology ensuring robustness and reliability to the system
- Software developed from non-proprietary platforms complying with GMP requirements (21CFR PART11 and GAMP 5) (\*)
- Remote supervision and maintenance 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 100% endoscopic control of process welds (not recorded) and 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

# EVO™ FERMENTORS

## TECHNICAL SPECIFICATIONS

### VESSEL, AGITATION & ACCESSORIES

#### VESSEL

- Jacketed vessel fitted with removable head plate
- Available sizes : 10, 15, 20 w/v - working aspect ratio of 1.7:1
- Material and finish (product-contact parts): stainless steel grade 1.4404 (316L) Ra ≤ 30 for vessel and ≤60 for piping
- Maximum operating pressure: 45 psig for vessel and jacket

#### AGITATION

- Top-mounted agitation equipped with one HTPG4™ impeller and one RUSHTON turbine or two RUSHTON - tip speed : 4 m/s
- Agitation with mechanical coupling

#### ACCESSORIES

- Round sight glass and illumination lamp
- Sanitary pressure relief valve and pressure gauge
- Inoculation tube for sterile addition
- Septum port with three injection needles / flask assemblies for reagent additions
- Product inlet for connection of one resterilizable addition assembly
- 5 x DN25 Ports for standard probes and sensors
- Septum port for 'flame or alcohol' sampling via syringe
- Harvest diaphragm valve (steamed during vessel sterilization)
- Up to four peristaltic pumps including one with adjustable speed for fed-batch culture
- 0.2 µm absolute filters on gas inlet and outlet
- Air supply to the sparger and the headspace

Code	Design type	Selection
X01	Bench top	
X02	Free standing vessel	
Code	Vessel Volume (Working/Total)	Selection
F01	10 L / 17 L	
F02	15 L / 23 L	
F03	20 L / 30 L	
Code	Vessel, agitation and accessories options	Selection
00	Oval sight glass to replace the round sight glass	
01	Vessel insulation	
02	Agitation with magnetic coupling	
24	Resterilizable inoculation / nutrient addition line	
27	Independent resterilizable sampling valve	
31	Exhaust gas condenser	
33	Dual purpose resterilizable bottom valve for harvesting and sampling	



### INSTRUMENTATION

- Automatic control of temperature, speed and pH or Redox
- Air flow-rate manually controlled via rotameter up to 2 VVM

Code	Instrumentation options	Selection
40	Air mass flow controller in replacement of the rotameter	
41	Automatic control of the head space pressure	
42	pO <sub>2</sub> measurement and control	
43	Foam level control	
45A	Vessel weight measurement (Scale)	
45B	Continuous level measurement	
49	Printer	
50	Control of nutrient flow rate	
51	Optical density measurement	
52	O <sub>2</sub> , CO <sub>2</sub> -exhaust gas analyzer	



### TEMPERATURE CONTROL

- Cultivation temperature automatically controlled by injection of plant hot or cold water into jacket
- Sterilization via direct / indirect steam injection

Code	Temperature Control Options	Selection
21	Jacket circulating pump	
23A	Heating with steam heat exchanger (*)	
23B	Heating with electrical heater (*)	
23C	Heating via direct steam injection	



(\*) To be combined with option 21

# EVO™ FERMENTORS

## TECHNICAL SPECIFICATIONS

### NEPTUNE CONTROL SYSTEM

#### HARDWARE CONFIGURATION

- Micro-PLC / PLC based control with a wide choice of Human Machine Interfaces: laptop or desktop PC as standard or optional Touch Screen PANEL PC
- Up to 16 configurable control loops for a wide range of process parameters including temperature, pH, Redox, speed control, pO<sub>2</sub>, foam, gas flow rates, weight or level, OD, pO<sub>2</sub> / pCO<sub>2</sub> on gas exhaust
- Control types include : PID, digital on/off and others – cascade mode for advanced control strategies

#### SOFTWARE CONFIGURATION

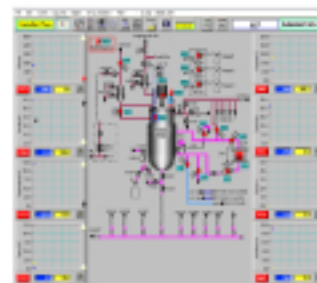
##### "Advanced" Version

- Customized User Access module complying with 21CFR PART11 (\*)
- Synoptic overview presenting all on-line measured values, actuator status, running phase, 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"	

### AVAILABLE SIZES AND DIMENSIONS

Nominal working volume	Minimum Working volume	Total volume	Depth	Width	Height		Weight Empty
					X01	X02	
10 L	5 L	17 L	950 mm	1320 mm	1800 mm	1400 mm	105 kg
15 L	7 L	23 L	950 mm	1320 mm	1880 mm	1500 mm	110 kg
20 L	8 L	30 L	950 mm	1320 mm	1900 mm	1600 mm	120 kg

