



Incubation

## TECHNICAL BULLETIN

### Applications with Incubator Oxygen Control

#### OXYGEN CONTROL

Most cell cultures are incubated at a 5% CO<sub>2</sub> level with the balance being ambient air. This has been the standard formula in clinical and research laboratory for years. Typically, with this 95%/5% mixture the O<sub>2</sub> in the chamber will be approximately 19.9% O<sub>2</sub>. (This number is derived from taking 20.95% of the 95% air).

This generally accepted formula of 5% CO<sub>2</sub> and 95% air has caused many investigators to overlook the primary purpose of a laboratory incubator: to create an in vitro model of the in vivo conditions of a cell culture or organism under investigation. There is much evidence that supports the theory that reduced oxygen tension in vitro increases the cellular activity of cell cultures including melanomas, embryos, macrophages, fibroblasts, and murine hybridomas.

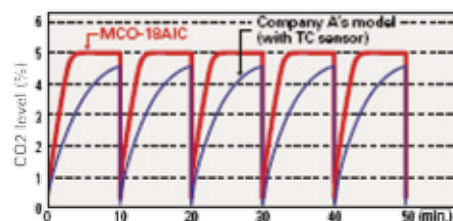
#### Sanyo's Advantage (Zirconia Sensor vs. a Fuel Cell for Controlling Oxygen):

1. Speed of response and accuracy especially with a solid electrolyte.
2. The sensor is non-depleting and does not require routine electrolyte replacement or replenishment.
3. The solid electrolyte will last the entire life of the sensor which is approximately 3 years vs. about a year for a fuel cell.
4. The sensor has an indefinite shelf life.
5. The sensor provides an accurate, sensitive, and repeatable, method of measuring oxygen in a variety of gases.

#### APPLICATIONS:

1. Primary Cell Lines
  - a. Arterial Blood 10%
  - b. Tumors 5%
  - c. Liver 5-7%
  - d. Eye 10%
  - e. Lower Lung Tissue 15%
2. Stem Cells 5%
3. Human Bronchial Explants in Culture- 45%
4. Amniocentesis- 2.5 to 7.5%
5. IVF
6. Human Marrow Cells
7. Apoptosis- Recent research has shown cell death has yielded a lot of interesting research results. As close as possible to 0% is necessary.
8. Wound repair research

CO<sub>2</sub> level fluctuations in chamber when door openings of 30-second duration are made at 10-minute intervals.



Feature/Company	SANYO	Brand A	Brand B
Capacity	6.0 cu.ft	6.5 cu.ft.	5.4 cu.ft.
Type	DHA	H2O	Air Jacket
O2 Sensor	Zirconia	Fuel Cell	Zirconia
Range	1-18, 22-80	20-Jan	1-21, 5-90
Inner Doors	10 standard	8	3
N2 Bubbling	Yes	No	No
IR/CO2 Standard	Yes	Option	Option
N2 Tank Switch	Yes	Option	Option
UV Option	Yes	No	No



MCO-18M

**REMINDER** - Customers moving to a new lab should choose an air-jacketed incubator for easy relocation.