

Highlighting innovative design features
and useful application information for
Thermo Scientific CO₂ Incubators.

smart notes

design and innovation ► CO₂ Incubation

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Q A

Why is a circulating fan essential to superior growth conditions in a CO₂ cell culture incubator?

Only a circulating fan can provide truly uniform conditions from top to bottom and side to side in your incubator. A circulating fan offers fast recovery of temperature, gas exchange and humidity, following routine door openings, to ensure cells grow in a well controlled, healthy environment.

When any incubator door is opened, physics dictate that the conditions inside rush to equilibrate with the external atmosphere. Once the door is closed, the use of an integrated fan provides the fastest recovery to your desired conditions, thus minimizing stress to cells from loss of temperature, CO₂ and humidity



Why Thermo Scientific CO₂ Incubators?

Active airflow circulation provides the most uniform growth conditions

Without a uniform environment throughout your CO₂ incubator, cells in different areas can experience varying conditions, leading to confusing results. Thermo Scientific fan-assisted incubator designs ensure homogeneous conditions throughout the entire chamber, so that all cells experience the same temperature, gas exchange and humidity, regardless of their location in the growth chamber. These standardized conditions form the basis of good, controlled science and meaningful, reproducible results.

Without a fan, stratification of critical incubator conditions can compromise research results

An incubator with no fan relies upon gravity convection, or slow moving thermal currents, for humidity transport and gas exchange. This design results in slow recovery rates such that frequent door openings can prevent your cultures from experiencing adequate exposure to your selected culturing conditions. Lack of uniformity within the chamber can create variation among your cell cultures with a negative impact upon your project goals. This is especially critical in an incubator with variable oxygen control, since oxygen concentration affects nearly every cellular process.

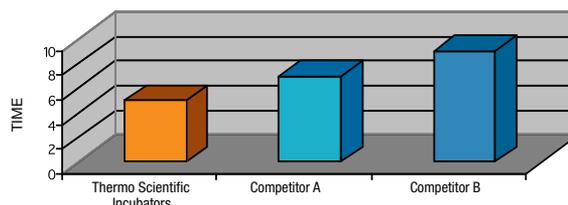
Incubators without fans do not benefit from the positive pressure that helps to prevent the entry of unwanted environmental microorganisms during door openings. The airflow systems in Thermo Scientific incubators are specifically engineered to provide a continuous, gentle flow pattern directed around the sides of the chamber to prevent disruption, evaporation and desiccation of culture medium.

► Summary

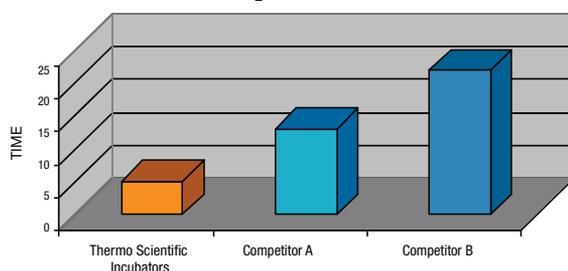
Thermo Scientific CO₂ incubators with precisely designed fan assisted airflow systems provide more efficient circulation of critical temperature, gas and humidity conditions to provide healthy, uniform cells.

Comparative Recovery Rates of Thermo Scientific Fan-assisted CO₂ Incubators vs. Fanless Designs

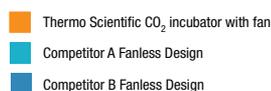
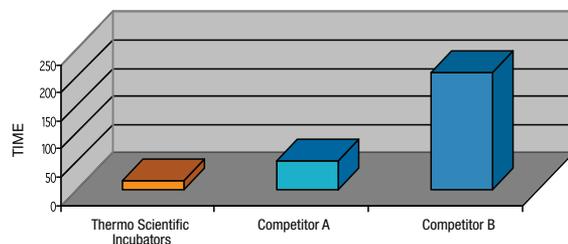
Temperature Recovery Rates



CO₂ Recovery Rates



rH Recovery Rates



Note: Data was collected following a 30 second door opening, 5% CO₂, 22°C ambient. Results may vary with operating conditions.

See how Thermo Scientific CO₂ incubators provide optimal cell growth. Learn more at www.thermoscientific.com/co2incubators

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