

Why good incubator management is critical for IVF clinics



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UK

There is a large and growing number of fertility clinics throughout the UK, all registered on the Human Fertilisation and Embryology Authority (HFEA) database. Each clinic is carefully monitored and assessed by the HFEA to ensure patients are protected and receive a service of high standard – even the clinic's 'Success Rates' and 'Inspection Reports' are published online.

Clinics naturally want to increase their success rates due to the high stakes of this application and attract clients, for example an unsuccessful cycle can cost the patient approximately £3000. Potential patients also use the 'Success Rates' to help them choose which clinic to use.

When an IVF cycle is not successful, the most common reason is due to the embryo having stopped growing before implantation. Other possible factors to be considered include the uterine receptivity and the mechanics of the embryo transfer, but the large majority of unsuccessful IVF cycles can be attributed to embryo quality.

In order to maximise the potential for good quality embryos, optimum conditions must be met and environmental stress must be reduced as much as possible. To achieve this eggs, sperm and the resulting embryos should be immediately transferred to the incubator. Once in the incubator, it is vital that the conditions within the incubator remain optimal at all times. Therefore good incubator management is key.

Optimal conditions for IVF success are 37 C temperature, 5% or 6% CO₂ (depending on the media used), 5% O₂ and no VOCs. CO₂ is particularly important as it controls the level of pH, which is vital to success. pH must be 7.2 and 7.4, however, pH meters are often unreliable and cannot be placed into the media otherwise they will contaminate the sample. Fortunately, there is a correlation between CO₂ levels and pH so by regulating the CO₂ you can regulate the pH.

It is often recommended that, because the conditions inside the incubator (and outside) are so vital, external verification is used. This ensures that any inaccuracies in the incubator's monitoring can be corrected – most incubators also only have one point of monitoring which will often not provide an accurate representation of the atmosphere inside the entire chamber.

Geotech's G100 portable CO₂ analyser has been specifically designed to ensure optimum conditions are met within an incubator to maintain a high quality of monitoring and plays a key role in good incubator management.

The G100 can also be used to measure O₂, temperature and humidity directly inside the incubator or, where smaller chambers (e.g. desktop incubators) are used, it can measure the gas directly from a tank if it is pre-mixed.

The dedicated Analyser Data Manager software also allows the user to log the data, draw graphs and can be used for auditing purposes using the 'Historical Data' facility.

By externally monitoring the incubator conditions with the G100, embryologists can rest assured they are maximising the chances of success.

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Geotech's G100 verifies CO2 in NHS incubators

March 11, 2016

Challenges the customer faced

Before they had Geotech's G100 CO2 incubator analyser, Stockton QC used a CO2 analyser with a collection of separate instruments for relative humidity and temperature.

The Geotech product

The customer bought a Geotech G100 CO2 incubator analyser. The G100 CO2 and O2 analyser with relative humidity and twin temperature probes was specifically designed to monitor CO2 for the verification of incubators in medical, IVF-clinic, research and pharmaceutical applications. The unit was developed to incorporate the latest required technology and specifications to give users a fast, simple-to-use and accurate CO2 incubator analyser.

Ian Buckingham, gas systems and workplace monitoring specialist at Stockton QC said:

"Using one instrument is much simpler and easier. The G100 CO2 analyser works very well; any one of our team is happy to pick it up and take it to site to analyse and quality check incubators. It is much quicker now with everything all in one instrument and easier to work with the various isolators. The G100 takes up much less space and we put it right inside laminar flow cabinets, while they are in use and running."



G100 aids successful IVF clinic with incubator verification

March 14, 2016

About the customer

Assisted Reproduction Unit based in the United Kingdom

Challenge the customer faced

The principal embryologist at the ARU needed an easy-to-use and reliable way of checking that the incubator's on-board CO₂ and temperature monitors could be verified.

The Geotech product

ARU purchased the Geotech G100 CO₂ analyser and use it to demonstrate accurate and repeatable CO₂ readings of the atmosphere inside the incubators. In just a few seconds the embryologist is able to take a reading from each of the different incubator models used in the ARU, including Thermo, Sanyo and Galaxy. Each model has a different means of sampling the air inside without fully opening the incubator inner door and adversely affecting the environment.

The G100 in use

To demonstrate the stability of the incubation conditions, the embryologist carried out a study, using the G100 to monitor CO₂ levels. Volatile organic compounds (VOCs) were also monitored during the project. The embryologist found that he could confirm, using the G100, that the CO₂ levels were being held at a very consistent levels, with readings varying no more than 0.1% either side of the target 6.0% CO₂.



CO2 monitoring for Pfizer

March 14, 2016

How the company uses the G100

Pfizer uses Geotech's G100 portable CO2 analyser to quality check their 25 medical incubators to ensure that the CO2 environments are as required. The incubators, kept at 37 degrees Celsius and five percent carbon dioxide (CO2), are manufacturer-fitted to regulate themselves and display their environments.

Using the G100 to check CO2 levels

Pfizer also used the G100 to investigate varying levels of CO2 concentration; they were varying up to three percent due to the incubator doors being opened and closed frequently. Once identified, Pfizer were able to fine-tune the incubators to ensure target CO2 concentrations were maintained. Checking the readings for each incubator's performance is now a fast and simple job: We bought Geotech's G100 because we had seen variable data from an experiment; we thought it could be due to fluctuating CO2 concentrations and we wanted to see if that was the case. Now we are also able to show colleagues, when checking any 'strange' experimental results, if the incubator environment was how it should have been at the time of the experiment".

"Checking an incubator by attaching the G100 a sample port only takes a couple of minutes so we can do all 25 within an hour," said Tim Stroud. "We keep a log of the readings on a spreadsheet so we can track how each incubator is performing over time. If we repeatedly had to adjust the level it may indicate that there was something for an engineer to attend to on the incubator," he said.