Introduction of Gas-phase Filters Improved IVF Centre's Success Rate

CASE STUDY - IVF CENTRE

Customer Profile

- Location: **Paschim Vihar, Delhi, India**
- Offers medical services in the field of General consultation, General Surgery, Obstetrics, and Gynaecology as well as Urology specialties
- Provides treatment in Dysmenorrhea, Reconstructive Urology, Laparoscopic Surgery, Embryo Donor Program and Intracytoplasmic Sperm Injection (ICSI), etc

Air quality in healthcare facilities is crucial, especially in critical areas like OT, ICUs, NICUs and IVF labs. Particularly, IVF laboratories require an appropriate environment, and this can have significant effects on embryo development. According to a recent study, ART (Assisted Reproductive Technology) lab design and construction of the HVAC system and operational practices play a vital role, in optimizing air quality to minimize physicochemical risks to the embryo.

Filtration Situation

As the IVF technology is proceeding further and becoming popular, the requirement of clean and filtered air in ART labs has become significantly important for a high success rate. Air quality may influence embryo development and the clinical outcome of IVF treatment. Many of the indoor air pollutants can settle on lab surfaces and dissolve in aqueous solutions of embryo culture medium.

This is the case of 2014 when the newly opened IVF centre facing a significant decrease in the success rate. The same has been reported and researched to understand the reason for this fluctuation. They analysed the procedures performed by embryologists or physicians, products used for embryo transfer like catheters, pipettes, disposable products were also not correlated with the events. The possible reason would be the air quality of the lab.

The lab was using standard AHU (Air Handling Unit) design with particulate filters to maintain clean air. No significant importance was given to gaseous contaminants during the design stage and the clinic was not aware of the issues which can arouse from gaseous elements. However, air contains airborne contaminants in gaseous forms which are from natural(ozone) or man-made sources (NOx, VOCs, SO_2, H_2S). These can also have a significant effect on growing gametes and embryo. The standard air filtration system could only help to remove airborne particles and failed to remove organic and inorganic molecules.

So, the objective of the clinic was to install the right air filtration system to effectively control both airborne particulates and VOCs (Volatile Organic Compound) in ART labs. Hence, they approached AAF.

AAF International Solutions

AAF representative begins by testing and analysing the chemical air contamination and linked pregnancy rates to gases from the test where VOCs, NOx, O3 (ozone) and few acidic gases such as SO2 were detected.

The perfect solution would be SAH (Side Access Housing) with Gas-phase filters at fresh air installation which will take care of higher gas concentration from the ambient air and as additional prevention to enhance air quality, we would also install Recirculation Unit or a stand-alone air purifier inside the lab.

AAF proposed to install a stand-alone air purification system, SAAF RU (Recirculation Unit) to improve air quality inside the lab due to space restriction. The big air cleaner recirculates and cleans the air in a controlled environment, and it is suitable for in-room use or sheltered outdoor installation. RU comes with particulate filters, gas phase cassettes and high efficiency filters to create total clean air solutions.

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Extra space outside the lab area allowed AAF engineers to design and mount the RU via a flexible ducting system. This gave an added advantage during maintenance of the air cleaner as well. The air cleaner effectively removed airborne particle and gaseous contaminants entering the IVF Lab.

Results

AAF installed customized RU unit designed for this IVF centre. There was an increase in the success rate by 25% and an air quality analysis after installation and operations of the RU unit detected minimum values of gaseous contaminants.

Fig. RU Unit

AAF India Pvt Ltd, 117&118, Bommasandra Jigani Link Road, Anekal Taluk, Bangalore 560 105 marketing@aafindia.net I +91 80 2 7839903

Bringing clean air to life.

AAF has a policy of continuous product research and improvement and reserves the right to change designs and specifications without notice.