WHAT IS SF\textsubscript{6} GAS?

 Sulphur Hexafluoride (SF\textsubscript{6}) is a synthetic gas comprising of sulphur and six fluorine atoms. Key properties of the gas are that it is extremely chemically stable and has a relatively high density. Commonly used in the electrical industry as an insulating medium, the properties of the gas also make it highly suitable for use in ophthamology.

WHY IS GAS ANALYSIS ESSENTIAL?

In order to validate their techniques, it is important that ophthalmologists analyse the composition of the air/SF\textsubscript{6} gas mix prior to its use in surgery. In doing so higher precision, purity, traceability, accuracy and performance can be achieved.

ABOUT CAMBRIDGE SENSOtec

Cambridge Sensotec is an established manufacturer of the Rapidox range of high precision gas analysers. The company collaborated with specialists in ophthamology to develop a bespoke Rapidox SF\textsubscript{6} 6100 analyser, which is capable of analysing a minimal amount of SF\textsubscript{6} gas.

As a privately owned company, staffed by highly skilled technologists, the company is perfectly placed to react to its customers specialised gas analysis requirements. Dynamic and flexible, the company are able to design and supply solutions to suit a variety of gas analysis applications.

Find out more about SF\textsubscript{6} gas analysis at: www.sf6.co.uk

SF\textsubscript{6} gas and Ophthalmology

Applications within the medical and pharmaceutical industry are vast with gases being delivered directly to patients for therapy (e.g. ventilators or anaesthesia) or used for storage, cryogenic freezing or incubation. Pharmaceutical companies use gases within the manufacturing process of many products and ingredients, in addition to analysis taking place in laboratories.

WHAT IS OPHTHALMOLOGY?

Ophthalmology is the surgical or medical care of any conditions that affect the eye or its associated tissues. These can include; cataracts, genetic eye disorders, trauma or disease. The retina is a light-sensitive layer of tissue that derives metabolic support from the underlying retinal pigment epithelium (RPE). If the retina becomes detached from the RPE it loses function, and so the eye loses sight: this condition is termed retinal detachment. Retinal detachment may be due to a hole, or break, in the retina (rhegmatogenous retinal detachment), inflammation or leakage (exudative detachment), or contraction of epiretinal membranes (tractional detachment). Rhegmatogenous and tractional retinal detachment are repaired surgically by a technique called vitrectomy.

WHAT IS A VITRECTOMY?

During a vitrectomy, an ophthalmologist (medically trained eye specialists), will remove the vitreous humour, a clear gel-like substance that lies behind the iris. In doing so, they will gain access to the back of the eye, where they may repair the damaged retina.

SF\textsubscript{6} AND ITS USE WITHIN OPHTHALMOLOGY

At the end of the vitrectomy surgery, the ophthalmologist is required to fill the space left by the vitreous gel. This can be achieved by injecting a mixture of SF\textsubscript{6} gas with air into the posterior segment of the eye, in order to create a bubble, which “tamponades” the retina while it heals. Due to the low solubility of SF\textsubscript{6} the gas mix remains unabsorbed for 3-4 weeks. In comparison, air takes only a few days to become reabsorbed, which does not allow retinal attachment sufficient time to become secure.