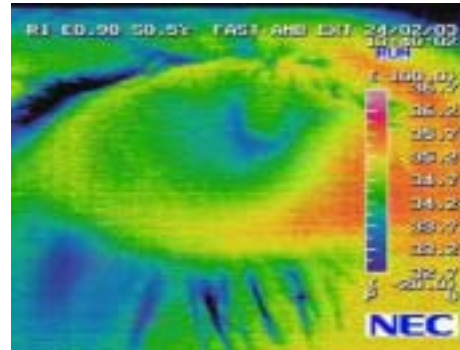


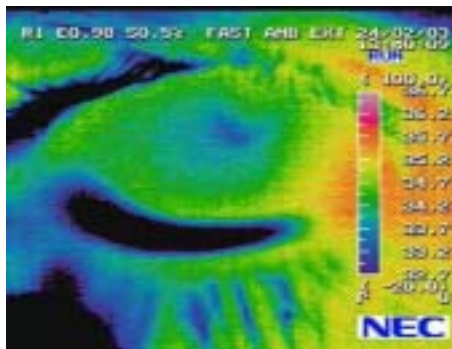
THERMOGRAPHY – IN THE BLINK OF AN EYE

Researchers in the Neurosciences Research Institute at Aston University are utilising Infrared Thermography in their studies into ocular physiology, with investigations taking place into the effects on the eye of contact lens wear, the use of medications in the eye, dry eyes and ocular abnormalities. Further plans by the Anterior Eye Group include looking at the thermal effects of laser refractive surgery on the eye.

Because of the unique ability to capture an image in real-time and its high resolution capabilities, the NEC TH7102MX Thermal Imaging Camera can capture as a colour coded display the small and ever changing temperature gradients across the eye's surface - each blink passes fluid across the eye providing a warming effect. Thermal imaging can capture these variations in temperature and has the advantage of being a completely non-invasive method of measurement that allows the eyes to be examined without any discomfort to the patient.



Thermal Image of the eye before eyedrop



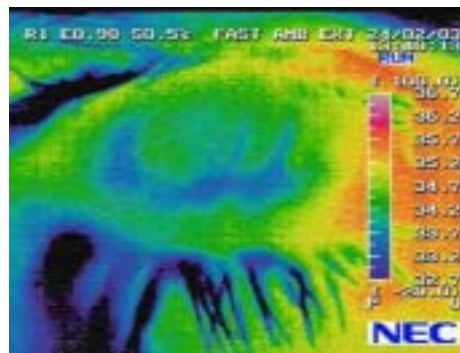
Eye Drop has been inserted - note the cold areas as the fluid flows across the eye

The aim of the research is to improve the understanding of the dynamic thermal profile of the eye's surface. Questions being asked include "Is the comfort of an artificial tear drop related to its effect on temperature?" and "Do some types of contact lens create a hotter environment in the eye and what implications this may have?"

An image of the eye is taken in a room controlled for temperature and humidity and the dynamic change in temperature over 8 seconds following a blink is recorded. This is used as a standard to which other conditions are compared. For example, an artificial tear supplement can be instilled and the dynamic temperature profile measured over time. The effect

of the eye drops on the temperature of the eye can be clearly seen, as detailed in the images. The results are then analysed and are proving to be exciting.

The concept of using thermography as an aid into research is not a new one, with many universities and research laboratories using it to measure temperature in a wide variety of areas, both mechanical and physical. Historically however, ocular thermography has been restricted by the technology available; the cameras were cooled by liquid nitrogen and were very expensive. The TH7100 series of Thermal Imaging Cameras from NEC however, do not rely on liquid nitrogen to cool the detector, making it far more suitable for clinical research.



After Eye Drop inserted - note the cooler surface of the eye compared with Image 1

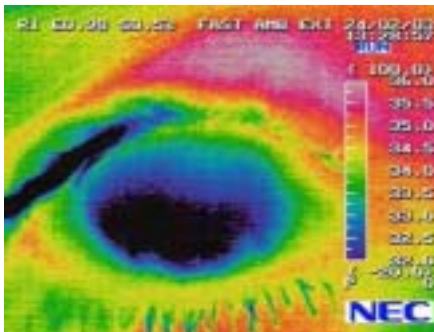
The purchase of the NEC camera at Aston University was initiated by Dr. James Wolffsohn, of the Anterior Eye Group. The research group which comprises mainly of optometrists, has a complete suite of self-contained laboratories designed for clinical investigations which promotes a collective approach to clinical research issues. These are adjacent to the optometry open-clinic which is a valuable source of patient material, consultation areas and reception facilities for clinical research studies.



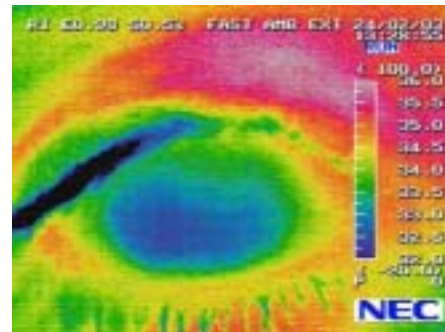
NEC Thermal Imaging Camera

A major new development at Aston University is the establishment of the Cornea and Refractive Surgery Research Centre. This will provide valuable clinical research information on the efficacy of procedures to correct errors in refraction and the physiology of the anterior segment of the eye and cornea. With the results already achieved by the Anterior Eye Group, it is expected that the NEC Thermal Camera could become a useful tool for the CRSRC.

Aston University is an internationally recognised centre of excellence in teaching, research and consultancy, and in the most recent Research Assessment Exercise, four out of five departments scored Grade 5 ratings, indicating national and international excellence in all of the research activities within those departments.



Eye with Contact Lens - before blink - note the cold area under the Contact Lens



Eye with Contact Lens - after blink - note the warmer area across the lens

For further details about the range of Thermal Imaging Cameras and Services that Metrum can offer, please contact:

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