CAVACam
## *An Ultra-Clean Camera for UCV Vacuum Applications*

Introduction

CAVACam is a customisable CAmera for VAcuum applications, specifically designed to be compliant with ultra-clean vacuum (UCV) standards. The CAVACam has been manufactured using vacuum-compatible materials which are low-outgassing and minimise contamination risk. Available with a wide range of detectors, the modular design can be easily adapted to suit a range of scientific applications.
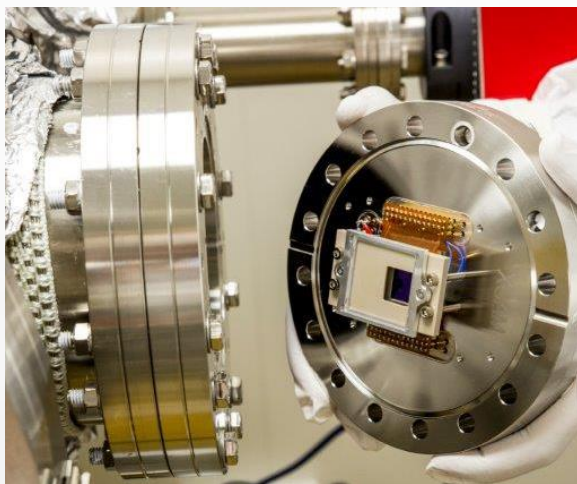
CAVACam (F-model)

The CAVACam is available as a conflat flange model (F-model) or as a hermetically sealed, fully vacuum-immersible model (S-model). Detectors are available in both front-illuminated (FI) and back-illuminated (BI) formats to cater for all imaging requirements. BI detectors may also be available with no AR coating for improved soft X-ray performance. EMCCDs are available for low-light imaging and single photon detection applications.

XCAM has a wealth of experience and expertise manufacturing cameras for ultra clean vacuum applications having successfully developed vacuum cameras for many prestigious scientific and industrial institutions around the world.

Key Features

- Clean construction to UHV, XHV or UCV standards as required
- Guaranteed not to contaminate your vacuum chamber if operating instructions are properly followed
- Available with a wide range of EMCCD and CCD detectors, front- or back-illuminated
- Electronic drive systems suitable for:
    - high flux and high frame rate with exceptional linearity
    - extremely low noise levels at slow speeds for sensor-limited noise performance
    - single photon detection and sub-pixel spatial resolution, as demonstrated by the RIXSCam, one of XCAM's signature advanced camera systems
- Multiple camera heads and/or detectors can be operated synchronously
- Systems are individually optimised for each detector type to give the best performance
- Water-cooled Peltier capable of cooling down to -50°C if required
- Cryocooled solutions also available capable of cooling to -110°C
- Modular design enables easy customisation to cater for individual requirements
- RGA scan can also be conducted if required

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CAVACam F-Model (Conflat Flange)
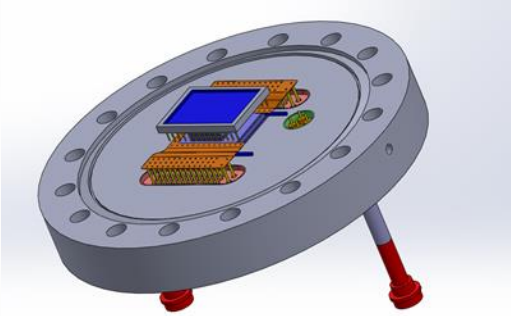
The CAVACam F-model is a camera head which is built on a conflat-style flange. The detector and cooling system are on the vacuum-side of the flange, with the electronics on the air-side of the flange. Hermetic electrical feedthroughs maintain the vacuum chamber integrity and ensure that the non-UCV compatible electronics remain safely away from your vacuum experiment.

CAVACam S-Model (Fully Vacuum-Immersible)

The CAVACam S-model is a camera head which can be entirely immersed inside an experimental chamber. Hermetically sealed in a stainless steel 'box', the non UCV-compatible electronics are safely sealed away inside the vacuum to prevent contamination. The detector is on the outside of the box and fully immersed in the vacuum chamber. The S-model is ideal for applications where the detector needs to be fully immersed inside the vacuum chamber and an F-model CaVACam may not be possible due to spatial limitations of the experimental set-up.
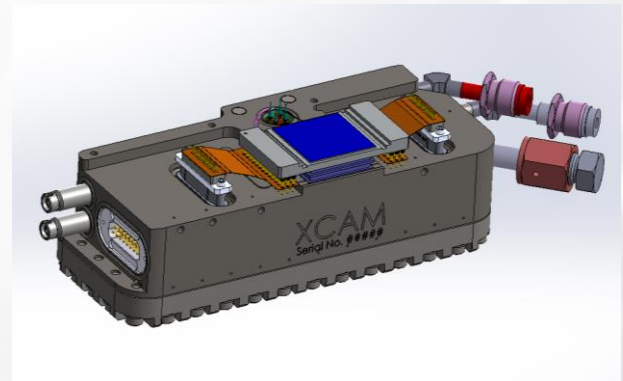
CAVACam Detector Range

The 2008, 2010 and 2011 series have been designed to cater for a variety of imaging requirements. Each CAVACam series is available in both the F-model and S-model. A wide range of detectors, in both full frame and frame transfer, are available within each series; XCAM have special expertise in selecting the ideal detector for the job.

2008 Series
- *Extremely low noise at slower readout speeds*
- Up to 4 channels/output nodes for readout speeds of up to 180KHz (lowest possible readout noise)
- Up to 2 channels/output nodes for slightly higher readout speeds of 1-2 MHz

2010 Series
- *Ideal for high flux, high frame rate applications*
- 4-channel operation at up to 3 MHz per output node (5 MHz coming soon)
- Excellent linearity over whole range

2011 Series
- *Ideal for low-light applications where single photon detection may be required*
- Individual photon-centroiding to within a fifth of a pixel for relevant applications
- 4-channel operation at up to 3 MHz per output node (5 MHz coming soon)
- Excellent linearity over whole range