

High Resolution X-Ray CCD Camera

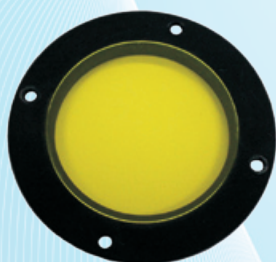


A high-resolution imaging system designed for low energy radiation imaging (X-rays, electron and UV). The system consist of a high-resolution CCD digital camera and a thin YAG:Ce or LuAG:Ce single crystal scintillating screen.

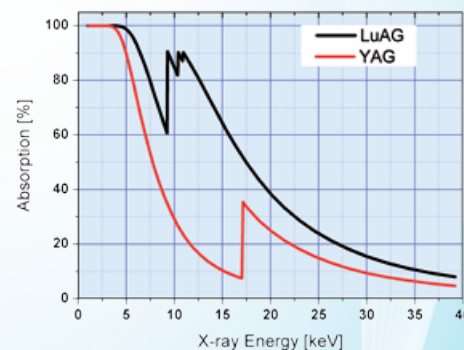
YAG:Ce And LuAG:Ce Single Crystal Screens

Yttrium aluminum garnet activated by cerium is a fast scintillator with excellent mechanical and chemical resistance. YAG:Ce scintillation detectors are the preferred choice for electron microscopy, beta and X-ray counting, as well as for electron and X-ray imaging screens.

Lutetium aluminum garnet activated by cerium is a scintillator with high X-ray radiation absorption and excellent mechanical and chemical resistance. LuAG:Ce scintillation detectors are the preferred choice for X-ray radiography imaging screens.



YAG:Ce Imaging Screen



Low Energy X-ray
Absorption in YAG and LuAG

The optical properties of the YAG:Ce and LuAG:Ce materials enable achieving the very high spatial resolution of 1 micrometer. The spatial resolution of the screen depends on screen thickness, photon energy and photon absorption depth. An optical system using a magnifying lens was used to transfer the scintillator screen image to the CCD image area surface. The emission wavelength of both materials is well suited for coupling with silicon detectors like CCD and photodiodes.

High Resolution X-Ray Imaging System

Specification

CCD size: 11 Mpix, 4008 x 2672 pixels

Pixel size: 9 μm x 9 μm

Field of view: 24 mm x 36 mm

Binning: 1x1 to 16x16

Reading: one or two ADC gateways

Antiblooming: SW controlled

Exposure time range: 0.8 s to 30 min

Frames accumulation: 1x to 99x

Dynamic range: up to 4000

Image acquisition: quick preview mode/ acquire mode

Features: background subtracting, flat field correction

Cooling: Peltier with SW precise regulation and temperature set point

Temperatures: max. -30°C below cooling water

Data interface: 100 Mbit/s Ethernet (100BASE-T)

CCD signal processing: correlated double sampling (CDS) + 16 bit A/D converter

ALTERNATIVES

Energy range: up to 60 keV depending on scintillator thickness

Optics used: camera objective (10 micrometer resolution)

or magnifying objectives (1 micrometer resolution)



High Resolution Imaging System



Power and Control Unit

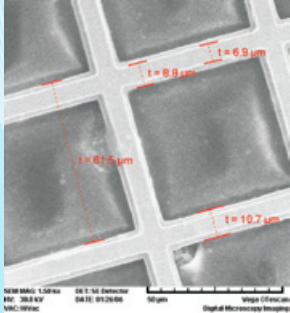
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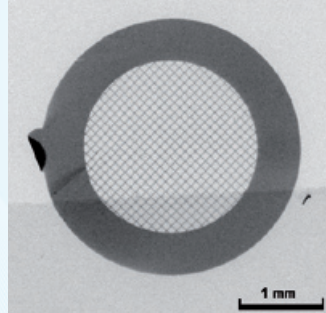


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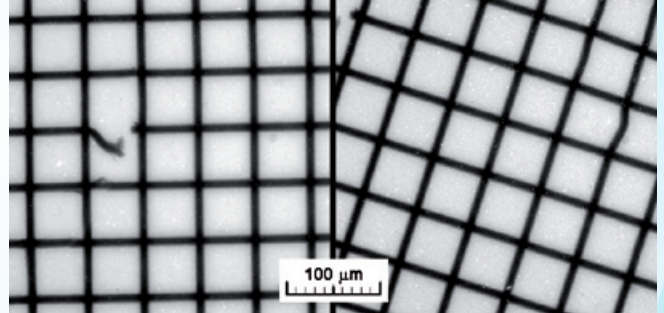
Test Results



Test Grid with 8 Micron Thick Wires, SEM Image



The Grid in X-Rays

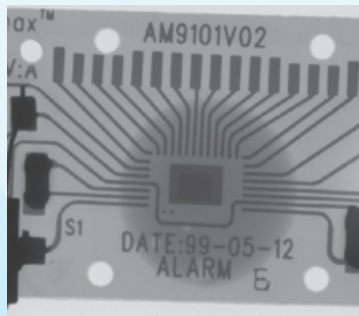


X-Ray High Resolution Radiographs of the Grid

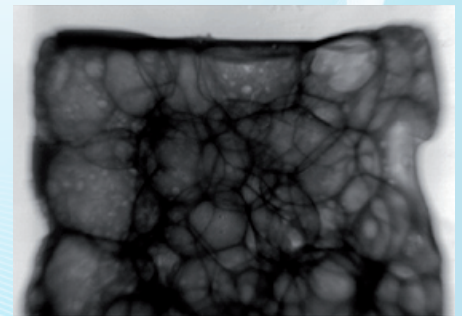
X-Rays MicroRadiography Applications



Spider



Electronic Board



X-Ray Radiograph of the Aluminum Foam

- Biological and medical objects
- Electronics - integrated circuit inspections
- Light-weight materials with pores

- X-ray, UV, synchrotron beam inspection and measurements
- Highly detailed X-ray ND inspections
- Composite material inspection and development



Cable Connector



Features

- High radiation hardness of the imaging system
- High resolution down to 1 micron
- X-ray, electron and UV detection with the same system
- Complete system solution and supply

WE ARE ABLE TO DESIGN AND SUPPLY A COMPLETE IMAGING SYSTEM CUSTOMIZED TO YOUR APPLICATION.