

Imaging Screens



Crytur has developed excellent imaging screens based on the YAG:Ce, LuAG:Ce and YAP:Ce materials. The advantage of these thin screens is their high spatial resolution in imaging applications.



YAG:Ce Screens



YAP:Ce Screens

Materials for Imaging Screens

The main important properties of the YAG:Ce, LuAG:Ce and YAP:Ce materials are high density, fast decay times and chemical, mechanical and temperature resistance. The materials can be machined into a variety of shapes and sizes.

Application

YAG:Ce scintillation detectors are preferred option for electron microscopy, beta and X-ray counting, as well as for electron, X-ray, UV and EUV imaging screens.

LuAG:Ce has a higher density than YAG:Ce which results in thinner screens with higher spatial resolution.

YAP:Ce detectors are used for gamma and X-ray counting, electron microscopy, electron, X-ray and UV imaging screens and tomography systems.

Types of Imaging Screens

Standard Imaging Screens

Standard imaging screens have the shape of cylindrical plates. Rectangular screens are available on request.

SIZE RANGE

Diameters range from 3 up to 50 mm and thicknesses from 0.05 to 5 mm.

MARKING

Imaging screens can be provided with marking lines of 0.05 to 0.2 mm in thickness.

COATINGS

Surfaces can be fashioned with various thin layers depending on the particular application.

Conductive coatings: Al, carbon or ITO (Indium Tin Oxide).

Reflection coatings: Al, Au or dielectric layer.

Diffusion painting: TiO_2 , Al_2O_3 .



YAG:Ce Screen with Cross



LuAG:Ce Screen with Grid



Imaging Screens

Thin Imaging Screens on Substrates

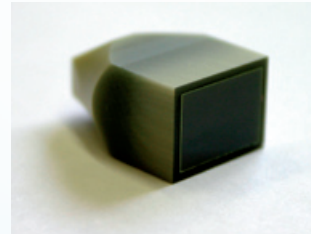
Thin YAG:Ce, LuAG:Ce, and YAP:Ce screens are made of selected crystal materials and are tested for optical homogeneity. Screens can be made down to 0.1 or 0.005 mm depending on scintillation material and diameter. Thin screens are optically coupled to a fibre optic (FOP, Taper) or glass substrate.

SUBSTRATES

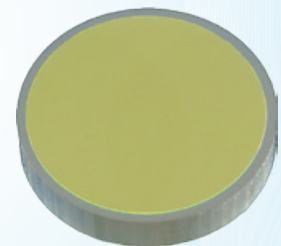
BK7, quartz glass, YAG, sapphire, etc., FOP or Taper.
Thickness of substrate down to 0.17 mm

SIZE RANGE

Diameter up to 40 mm, thickness down to 0.005 mm.



20 Microns Thick
YAG:Ce Screen on Tapered FOP



YAG:Ce Screen on FOP

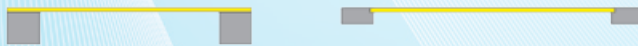
Thin Freestanding Imaging Screens

FREESTANDING SCREENS

Very thin freestanding YAG:Ce, LuAG:Ce, or YAP:Ce screens are not coupled to any substrate (glass or fibre optics). Detectors are supplied both in screen or detection qualities.

FRAME SUPPORTED SCREENS

Products of this size and thickness are very fragile and sensitive to manipulation. As an optional solution, safety and manipulation can be significantly enhanced by gluing a frame to the screen edge. The frame can be made of an Al_2O_3 -based ceramics, Al, or stainless steel. Typical frame dimensions: 2 mm width and 2 mm thickness.



Frame Types

SIZE RANGE

Diameter range from 3 to 20 mm, thickness down to 0.015 mm.



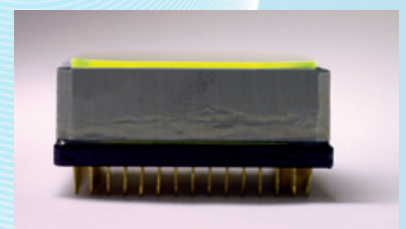
YAG:Ce Screen on Aluminum Frame

Imaging Systems

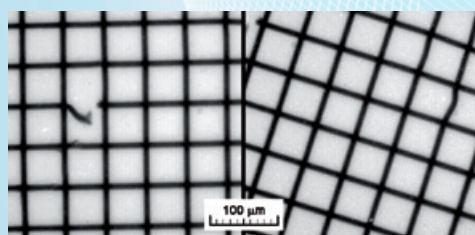
YAG:Ce or LuAG:Ce screens coupled together with fibre optics and a CCD chip form the basis of the most commonly used imaging systems. Direct Taper or FOP bonding to CCD brings the highest efficiency in light transport.

RESULTS

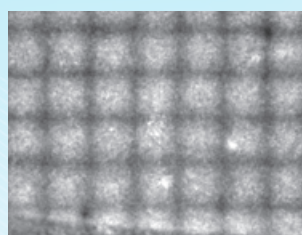
In X-ray radiography, these imaging screens provide high resolution of below one micrometer.



YAG:Ce - FOP - CCD System



X-Ray Radiographs of the 8-Microns Grid Imaged by LuAG:Ce and YAG:Ce Thin Screens



The Same Grid Imaged by P43 Powder Screen



X-Ray Radiograph of a Spider