X-RAY SCINTILLATOR

FOS ACS GPXS ALS

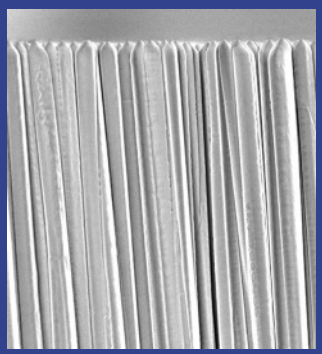
FOS® Fiber Optic Plate with CsI Scintillator

ACS® Amorphous-Carbon Plate with CsI Scintillator

GPXS® Great Performance X-ray CsI Scintillator

ALS® Aluminum Plate with CsI Scintillator

Scintillator: CsI(Tl)
Columnar structure



HAMAMATSU

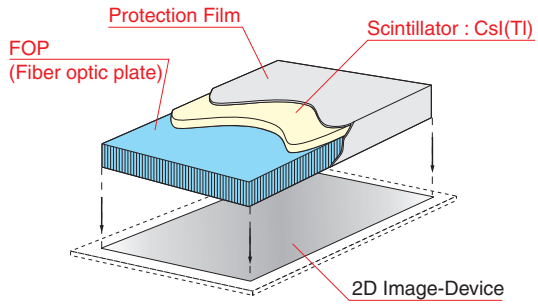
PHOTON IS OUR BUSINESS

X-RAY SCINTILLATOR

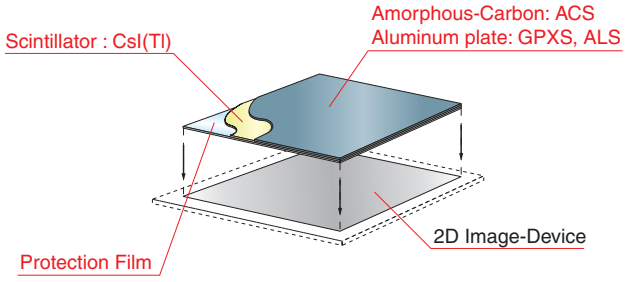
FOS ACS GPXS ALS

STRUCTURE

FOS



ACS / GPXS / ALS



FEATURES

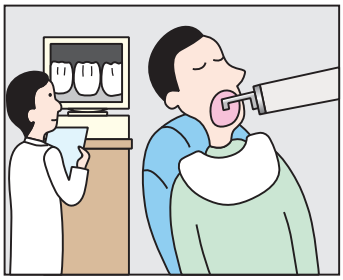
- **Large format** Maximum size: 468 mm (17") x 468 mm (17") for ACS, GPXS and ALS
- **High light output** 3.2 times higher with GPXS-HB type (CsI 400 μm) than Lanex-R (powdery phosphor). [Typ.]
- **High resolution** 20 Lp/mm at CTF 13 % FOS-HR type (CsI 150 μm). [Typ.]

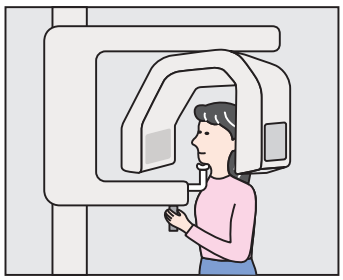
SELECTION GUIDE

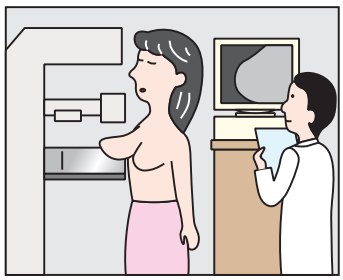
Product name	Structure	Availability in dimension				Features	Applications
		Scintillator effective area (mm)		Substrate thickness (mm)	Scintillator thickness (μm)		
		Max.	Min.				
FOS	Fiber Optic Plate with CsI Scintillator	150 × 150 *	10 × 10	1 to 3	1000 Max.	X-ray shield, Low energy X-ray detection	Dental intra oral, Dental panoramic, Mammography
ACS	Amorphous-Carbon Plate with CsI Scintillator	440 × 440	14 × 14	0.5 to 2		High resolution, Large format	Dental intra oral, Mammography, Chest examination
GPXS	Aluminum Plate with CsI Scintillator	440 × 440	14 × 14	0.5 or 2.2		High light output, Large format	Chest examination, Dental CT
ALS	Aluminum Plate with CsI Scintillator	440 × 440	14 × 14	0.5 or 1		High light output, Large format	Dental-panoramic, Chest examination

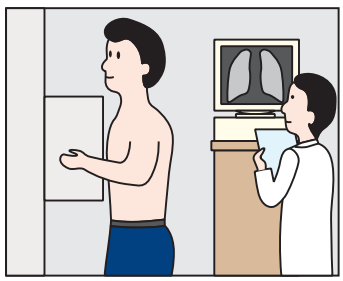
* CsI coating available on supplied FOP up to 440 mm × 440 mm.

APPLICATION EXAMPLE


Dental intra oral


Dental CT

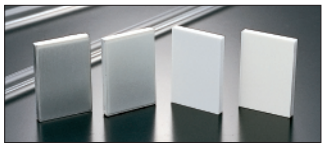

Mammography


Chest examination

STANDARD PRODUCTS LINE-UP

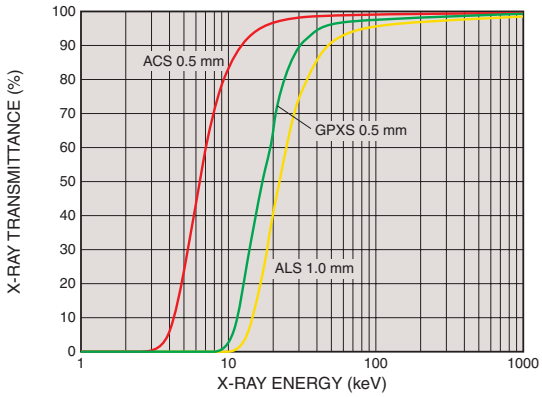
* Available in various sizes and scintillator thickness.

	Type No.	Scintillator type	Outer dimension (mm)	Effective area (mm)	Substrate Thickness (mm)	CsI Thickness (μm)	Relative light output Ⓐ (% Typ.)	CTF Ⓑ (% Typ.)	Type Ⓒ
FOS	J6671	CsI (Tl)	30.5 × 21	27 × 17	3	150	70	22 Ⓓ	HL
	J6671-01					150	40	38 Ⓓ	HR
	J6673	CsI (Tl)	50 × 10	47 × 7	3	150	70	22 Ⓓ	HL
	J6673-01					150	40	38 Ⓓ	HR
	J6675	CsI (Tl)	18 × 18	15 × 15	3	150	70	22 Ⓓ	HL
	J6675-01					150	40	38 Ⓓ	HR
	J6677	CsI (Tl)	50 × 50	47 × 47	3	150	70	22 Ⓓ	HL
	J6677-01					150	40	38 Ⓓ	HR
	J6679	CsI (Tl)	φ26.5	φ23.5	3	150	70	22 Ⓓ	HL
	J6679-01					150	40	38 Ⓓ	HR
ACS	J8734	CsI (Tl)	50 × 50	48 × 48	0.5	150	125	12 Ⓓ	HL
	J8734-01					150	50	25 Ⓓ	HR
GPXS	J13112	CsI (Tl)	50 × 50	48 × 48	0.5	600	270	33 Ⓔ	
	J13113					400	320	33 Ⓔ	HB
	J10666-100	CsI (Tl)	468 × 468	440 × 440	0.5	600	270	33 Ⓔ	
	J10666-200					400	320	33 Ⓔ	HB
ALS	J8978	CsI (Tl)	50 × 50	48 × 48	1	600	190	37 Ⓔ	
	J9857	CsI (Tl)	468 × 468	440 × 440	1	600	190	37 Ⓔ	



Ⓐ Relative values, with 100 % being equal to the light output from conventional phosphor screen (Lanex-R), Light output was measured by CCD with lens coupling under the following conditions :(X-ray tube voltage 60 kV p, aluminum filter 1 mm thick)
Ⓑ CTF (contrast transfer function) CsI(Tl) : X-ray tube voltage 60 kV p, aluminum filter 1 mm thick
Ⓒ HL: high light output type, HR: high resolution type, HB: high brightness type
Ⓓ at 10 lp/mm Ⓔ at 3 lp/mm

X-RAY TRANSMITTANCE

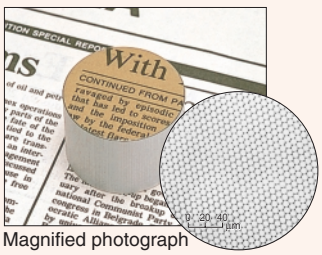


* a-C: Amorphous-Carbon
Amorphous Carbon has good X-ray transmittance characteristics because it is a light element material.
In addition, it is a glass like material with no particle causing blemish defects.
It can be polished to a good of flatness for combination with a 2D image device.
Also, it is environmentally safe.

WHAT'S FOP?

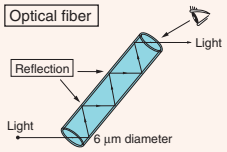
Fiber Optic Plate: FOP

The FOP is a optical device consisting of millions of glass fibers of several micrometers in diameter, bundled parallel to one another. Since light is transmitted through each fiber, an image appears to float. The image can be transferred from one end of the fiber to the other without any distortion. FOPs are widely used as optical devices that replace optical lens.

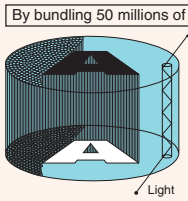

Magnified photograph

Why does the image appear to float?

The reason is the "optical fiber structure".



Light is transmitted from one end to the other while repeating reflection.



Each optical fiber transfers light, so the image (letter "A") appears to be floating.

X-RAY SCINTILLATOR

FOS | ACS | GPXS | ALS

X-RAY RELATED PRODUCTS

● MICROFOCUS X-RAY SOURCE

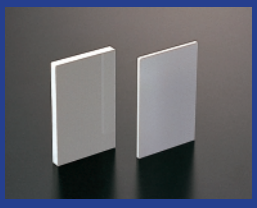
Due to the minute size of the focal spot, Hamamatsu microfocus X-ray sources allow capturing clear, sharp images even if magnified. Various types of microfocus X-ray sources are available including the sealed-off types of 90 kV, 100 kV, 110 kV, 130 kV and 150 kV and the open types of 110 kV, 160 kV and 230 kV.

● X-CUBE™ (COMPACT X-RAY CCD CAMERA)

X-CUBE™ is a compact X-ray CCD camera designed for non-destructive inspection. Using a general-purpose CCD chip mounted in a rugged but lightweight camera head, X-CUBE™ makes X-ray imaging as easy as handling ordinary CCD camera.

● X-RAY SHIELD FIBER OPTIC PLATE

The X-ray shield type FOP has a shielding capability about 5 times higher than a standard FOP when exposed to X-rays emitted from a 70 kV X-ray tube (comparison made using a 3 mm thick FOP). Almost all X-rays which have penetrated the scintillator and have not been converted into light are absorbed in the XRS-FOP. This eliminates X-ray damage of image sensors such as CCDs.



Type No.	Dimensions (mm)	Thickness (mm)	Fiber diameter (μm)	Numerical aperture (N.A.)	Resolution (Lp/mm)	Absorption material	Thermal expansion coefficient ($\times 10^{-7}$/°C)	Transmittance [diffused light] (%)
J11057-72	30 × 20	3	6	1.0	102	Included	77	66
J11057-73	50 × 50							
J11057-74	φ26.5							
J11057-75	100 × 100							

*PATENT: USA: USP6531225, USP6762420, Europe: EP1024374B, Japan: 1832818, 3126715, 3566926, China: ZL99801885.6

HAMAMATSU PHOTONICS K.K. www.hamamatsu.com

HAMAMATSU PHOTONICS K.K., Electron Tube Division
314-5, Shimokanzo, Iwata City, Shizuoka Pref., 438-0193, Japan, Telephone: (81)539/62-5248, Fax: (81)539/62-2205

U.S.A.: Hamamatsu Corporation: 360 Foothill Road, Bridgewater. N.J. 08807-0910, U.S.A., Telephone: (1)908-231-0960, Fax: (1)908-231-1218 E-mail: usa@hamamatsu.com
Germany: Hamamatsu Photonics Deutschland GmbH: Arzbergerstr. 10, D-82211 Herrsching am Ammersee, Germany, Telephone: (49)8152-375-0, Fax: (49)8152-2658 E-mail: info@hamamatsu.de
France: Hamamatsu Photonics France S.A.R.L.: 19, Rue du Saule Trapu, Parc du Moulin de Massy, 91882 Massy Cedex, France, Telephone: (33)1 69 53 71 00, Fax: (33)1 69 53 71 10 E-mail: infos@hamamatsu.fr
United Kingdom: Hamamatsu Photonics UK Limited: 2 Howard Court, 10 Tewin Road, Welwyn Garden City, Hertfordshire AL7 1BW, United Kingdom, Telephone: (44)1707-294888, Fax: (44)1707-325777 E-mail: info@hamamatsu.co.uk
North Europe: Hamamatsu Photonics Norden AB: Torshamnsgatan 35 SE-164 40 Kista, Sweden, Telephone: (46)8-509-031-00, Fax: (46)8-509-031-01 E-mail: info@hamamatsu.se
Italy: Hamamatsu Photonics Italia S.r.l.: Strada della Moia, 1 int. 6, 20020 Arese (Milano), Italy, Telephone: (39)02-93581733, Fax: (39)02-93581741 E-mail: info@hamamatsu.it
China: Hamamatsu Photonics (China) Co., Ltd.: B1201 Jiaming Center, No.27 Dongsanhuan Beilu, Chaoyang District, Beijing 100020, China, Telephone: (86)10-6586-6006, Fax: (86)10-6586-2866 E-mail: hpc@hamamatsu.com.cn
Taiwan: Hamamatsu Photonics Taiwan Co., Ltd.: 8F-3, No.158, Section2, Gongdao 5th Road, East District, Hsinchu, 300, Taiwan R.O.C. Telephone: (886)03-659-0080, Fax: (886)07-811-7238 E-mail: info@tw.hpk.co.jp

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