# X-RAY SCINTILLATOR

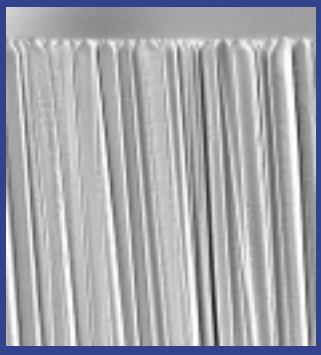
ACS ALS FOS

**ACS®** Amorphous-Carbon Plate with CsI Scintillator

**ALS®** Aluminum Plate with CsI Scintillator

**FOS®** Fiber Optic Plate with CsI Scintillator

Scintillator: CsI(Tl)
Columnar Structure



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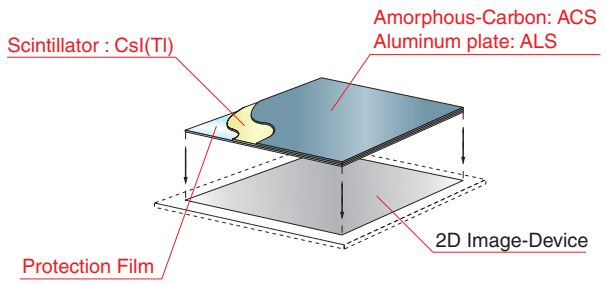
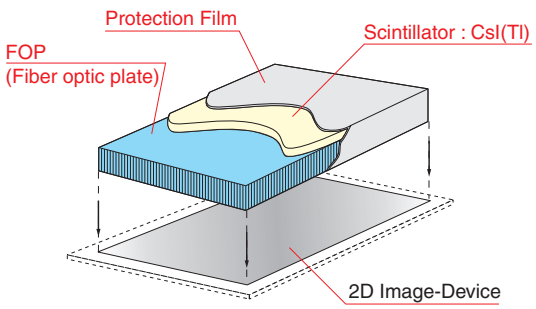
## STRUCTURE

### ACS / ALS




### FOS



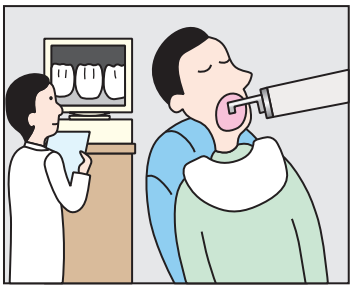

## FEATURES

- **Large Format** Maximum size: 468 mm (17") x 468 mm (17") for ACS and ALS
- **High Light Output** 2.5 times higher with ACS-HL type (CsI 600 μm ) than Lanex-R (powdery phosphor). [Typ.]
- **High Resolution** 20 Lp/mm at CTF 13 % FOS-HR type (CsI 150 μm). [Typ.]

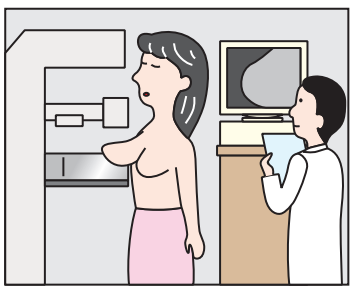
## SELECTION GUIDE

| Product name | Structure | Availability in dimension | | | | Features | Applications |
|---|---|---|---|---|---|---|---|
| | | Scintillator effective area (mm) | | Substrate Thickness (mm) | Scintillator Thickness (μm) | | |
| | | Max. | Min. | | | | |
| ACS | Amorphous-Carbon Plate with CsI Scintillator | 440 × 440 (17" × 17") | 14 × 14 | 0.5 or 2 | 600 Max. | High resolution, Large format | Dental inter oral, Mammography, Chest examination |
| ALS | Aluminum Plate with CsI Scintillator | 440 × 440 (17" × 17") | 14 × 14 | 1 | | High light output, Large format | Dental-panoramic, Chest examination |
| FOS | Fiber Optic Plate with CsI Scintillator | 240 × 180 (9" × 7") | 10 × 10 | 1 to 3 | | X-ray shield, Low energy X-ray detection | Dental inter oral, Dental-panoramic, Mammography |

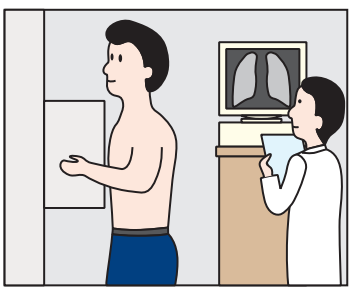
## APPLICATION EXAMPLE



Dental



Mammography



Chest examination

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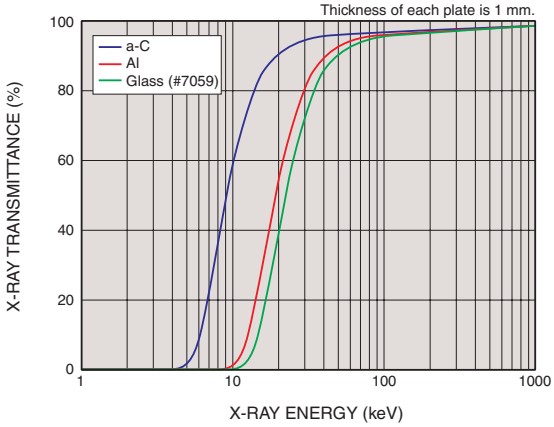
# STANDARD PRODUCTS LINE-UP

* 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 | 18 Ⓔ | HL |
| | J6671-01 | | | | | 150 | 40 | 33 Ⓔ | HR |
| | J6673 | CsI (Tl) | 50 × 10 | 47 × 7 | 3 | 150 | 70 | 18 Ⓔ | HL |
| | J6673-01 | | | | | 150 | 40 | 33 Ⓔ | HR |
| | J6675 | CsI (Tl) | 18 × 18 | 15 × 15 | 3 | 150 | 70 | 18 Ⓔ | HL |
| | J6675-01 | | | | | 150 | 40 | 33 Ⓔ | HR |
| | J6677 | CsI (Tl) | 50 × 50 | 47 × 47 | 3 | 150 | 70 | 18 Ⓔ | HL |
| | J6677-01 | | | | | 150 | 40 | 33 Ⓔ | HR |
| | J6679 | CsI (Tl) | φ26.5 | φ23.5 | 3 | 150 | 70 | 18 Ⓔ | HL |
| | J6679-01 | | | | | 150 | 40 | 33 Ⓔ | HR |
| ACS | J8734 | CsI (Tl) | 50 × 50 | 48 × 48 | 0.5 | 150 | 125 | 12 Ⓔ | HL |
| | J8734-01 | | | | | 150 | 50 | 25 Ⓔ | HR |
| | J8977 | CsI (Tl) | 468 × 468 | 440 × 440 | 2 | 600 | 250 | 33 Ⓕ | HL |
| ALS | J8978 | CsI (Tl) | 50 × 50 | 48 × 48 | 1 | 150 | 70 | 20 Ⓔ | |
| | J9857 | CsI (Tl) | 468 × 468 | 440 × 440 | 1 | 600 | 150 | 35 Ⓕ | |

Ⓐ150 μm thickness for the CsI(Tl) scintillator.
Ⓑ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
ⒺEat 10 lp/mm ⒻEat 3 lp/mm

# X-RAY TRANSMITTANCE

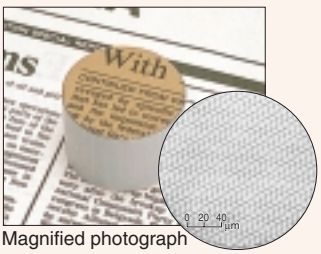



* a-C: Amorphous-Carbon
Amorphous Carbon has good X-ray transmittance characteristics because it is a light element material.
In addition, it is a glass like material with no particle causing blemish defects.
It can be polished to a good of flatness for combination with a 2D image device.
Also, it is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

WHAT'S FOP?

## Fiber Optic Plate: FOP

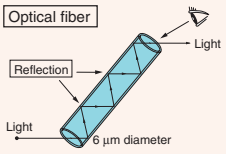
The FOP is a optical device consisting of millions of glass fibers of several micrometers in diameter, bundled parallel to one another. Since light is transmitted through each fiber, an image appears to float. The image can be transferred from one end of the fiber to the other without any distortion.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



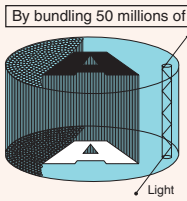

Magnified photograph

## The reason is the "optical fiber structure".

Why does the image appear to float?




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.

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# 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 80 kV, 90 kV, 100 kV, 110 kV, 130 kV and 150 kV and the open types of 160 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

XRS-FOPs provide enhanced X-ray absorption rate about 50 times higher than normal FOPs. 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. XRS-FOPs are available in sizes up to 50 mm × 50 mm

| Type No. | Fiber diameter | Numerical aperture (N.A.) | Resolution (Lp/mm) | Absorption material | Thermal expansion coefficient ($\times 10^{-7}$/°C) | Transmittance (%) | Dimensions (mm) | Thickness (mm) |
|---|---|---|---|---|---|---|---|---|
| J6745-01 | 6 µm | 1.0 | 90.5 | Included | 96 | 60 | 30 × 21 | 3 |

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



HAMAMATSU WEB SITE 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, P. O. Box 6910, 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-(0)1707-294888, Fax: 44(0)1707-325777 E-mail: info@hamamatsu.co.uk
*North Europe:* Hamamatsu Photonics Norden AB: Smidesvägen 12, SE-171-41 SOLNA, 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/E, 20020 Arese, (Milano), Italy, Telephone: (39)02-935 81 733, Fax: (39)02-935 81 741 E-mail: info@hamamatsu.it

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