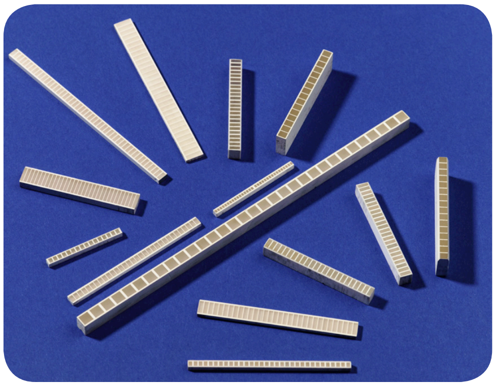
Low Afterglow Linear CsI(Tl) Segmented Arrays

Recent advances in CsI(Tl) array manufacturing have resulted in afterglow reduction, improved light output, and afterglow uniformity.

Single energy, dual energy, fixed frame, rotating gantry, CsI(Tl) based arrays can be used in almost any high quality X-Ray imaging application in a multitude of industries (Security Baggage Scanning, Cargo Scanning, Medical, Non-Destructive Industrial Inspection).

WHAT YOU DON'T SEE MAKES THE DIFFERENCE



Array Performance (Typical)	
Light output uniformity	±10% within an array (requires matching photodiode)
Light output array to array	±10%
Afterglow	5000ppm @100ms (initial test) ≤2500ppm (after burn in)
Afterglow uniformity	±10% within an array
Array Design Capabilities	
Number of channels (typical)	8-64
Minimum pitch	0.5mm
X-Ray thickness	50mm max

CRYSTALS

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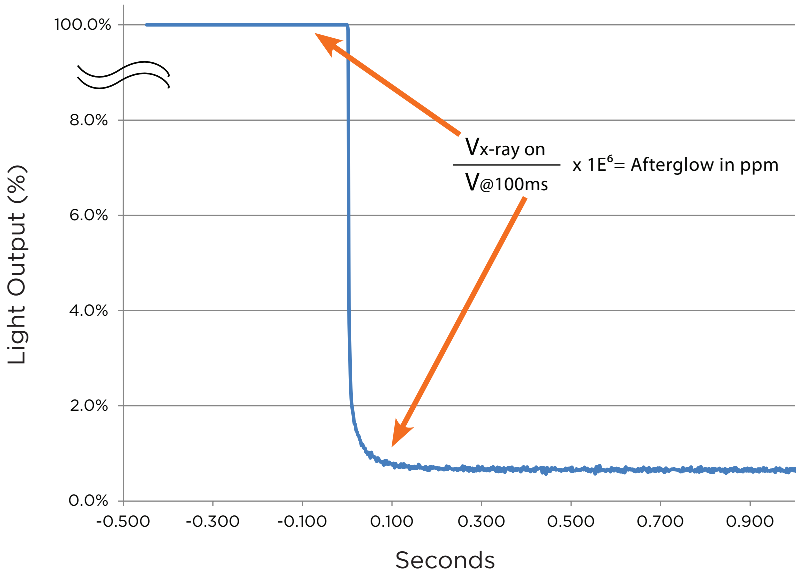
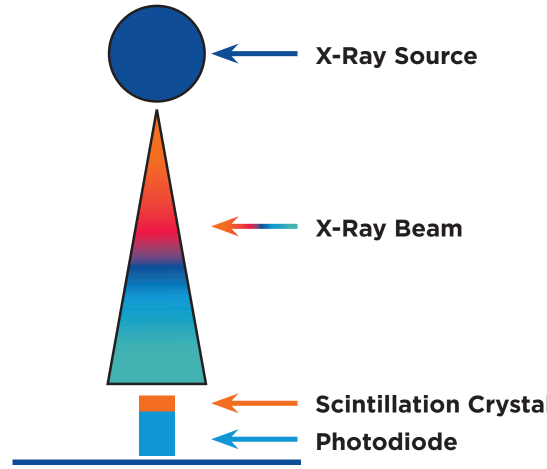


Afterglow Calculation

Typical Afterglow Test Set-up



CsI(Tl) Material Properties

Density [g/cm³]	4.51
Melting point [K]	894
Thermal expansion coefficient [C^{-1}]	54×10^{-6}
Cleavage plane	none
Hardness (Mho)	2
Hygroscopic	slightly
Wavelength of emission max [nm]	550
Lower wavelength cutoff [nm]	320
Refractive index @ emission max.	1.79
Primary decay time [ns]	1000
Light yield [photons/keVγ]	54
Photoelectron yield [% of NaI(Tl)] (for γ-rays)	45

X-Ray Test Parameter

X-Ray Power	120KV @ 1mA
Irradiation Time	2.5 Seconds
Afterglow Measurements	100ms
Distance Crystal to X-Ray Source	60 cm
Typical Sampling Rate	1 ms

Afterglow in PPM (parts-per-million) is calculated by dividing the output at 100 ms by the reference output with the X-Ray beam on, times 1 million to convert it to PPM: $\frac{V100}{Vref}(1E6)$

Light output calculation:

-% uniformity = (Min-Avg)/Avg

+% uniformity = (Max-Avg)/Avg

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www.crystals.saint-gobain.com

Manufacturer reserves the right to alter specifications.

(04-20)