



INDIAN INSTITUTE OF TECHNOLOGY BOMBAY
MATERIALS MANAGEMENT DIVISION
Powai, Mumbai - 400076

Technical Specifications of CZT X-ray Camera / Gamma-ray Camera Detector

RFx No. 6100001174 (Reference No. 1000028205)

I. Overall Features

1. Complete package, including ASIC to obtain digital output
2. Crystal composition approximately $\text{Cd}_{0.9}\text{Zn}_{0.1}\text{Te}$
3. Ohmic contacts between CZT crystal and ASIC
4. Low-power ($< 0.5 \text{ W}$)
5. Supported high voltage range: -400 to -800 V .
6. Minimal connections: power, HV, data

II. Energy specifications

1. Lower energy limit: $\leq 20 \text{ keV}$
2. Higher energy limit: $\geq 200 \text{ keV}$ required, option for higher energies preferred
3. Energy resolution: FWHM $\leq 6.5 \%$ at 122 keV (Co-57 line), $\leq 12\%$ at 60 keV (Am-241 line)
4. Photo-peak efficiency $\geq 40\%$

III. Pixel properties and geometry

1. Pixel size: $2-3 \text{ mm}$
2. Number of pixels: ≥ 256 arranged in a square array
3. Number of malfunctioning pixels (dead or noisy) ≤ 10
4. Thickness: approx. 5 mm

IV. Operational requirements

1. Maximum count rate: ≥ 1000 counts/sec, with $\leq 10\%$ loss due to dead time
2. Operating temperature: room temperature
3. Operating humidity: $40\% - 60\%$, storage $30\% - 70\%$

V. Conditions:

1. Demonstration of the technical parameters mentioned in the tender, if requested by the committee for technical evaluation of the quoted instrument, will be required.
2. Detectors should be space grade or must have space legacy – by being demonstrated on multiple Indian space missions. (Vendor must supply supporting documents along-with contact details of the users if requested).

VI. Warranty: 1 year