framatome
Intercontrôle

PCD HE

PCD HE – A New Detector for Digital Radiography (RT) inspection

The PCD HE (Photon Counting Detector High Energy), dedicated to real-time digital radiography inspections, optimizes inspection time, reduces dosimetry, and simplifies data analysis.



Challenge

Ad Radiographic inspections still often rely on film: expensive, slow to process, and not very flexible.
Users now expect a faster, safer, and easier-to-use solution, without compromising image quality.
The challenge: to reduce radiation dose, exposure time, and inspection complexity, while ensuring the highest precision in line with strict international standards.

Solution

The PCD HE detector produces accurate digital images very quickly and allows the selection of specific energy levels.

Unlike conventional radiography, digital radiography uses a capture system that generates directly usable images.

PCD HE is based on photon counting technology with direct conversion and low-noise electronics.

Each photon is counted individually, enabling precise image reading and the simultaneous acquisition of two energy thresholds.

Customer benefits

- Increased inspection accuracy and reliability
- Strong reduction of inspection time
- Lower radiation dose
- Easy to implement (no effluents, no consumables, no dedicated lab)
- Simplified traceability

Technical Specifications

- Maximum photon flux: 5×10^{8} photons/s per mm^2
- Single or dual imaging mode acquisition
- Pixel size: 100 µm
- Fill factor: 100%
- Shielding: W/Cu (90/10%)
- Active area: 130 × 50 mm^2
- Part of the Varex Imaging DC-THOR series, with two distinctions:
  - CdTe sensitive layer thickness: 3 mm
  - Adjustable energy threshold up to 1300 keV

Design and Robustness

- Dimensions (L × W × H): 300 × 140 × 90 mm^3
- Weight: 7 to 10 kg
- Shock resistance: up to 20 G
- Maximum temperature gradient: 20°/h
- Operating temperature range: +5°C to +40°C (max humidity 85%)

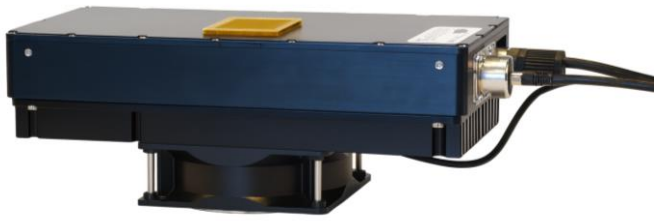
© Framatome / A3199-P-FR-G-EN-202602_PCD_HE

Connectivity & Interface

- Connection via laptop + RJ45 CAT 6 (fiber optic coming soon)
- Powered by a standard 220 V outlet
- GUI acquisition included: real-time monitoring
- GUI calibration/correction included: parasitic radiation subtraction possible

Implementation, Handling

- Simple software installation on control PC(s), no license required
- Tutorials provided and support available
- No handling required for PCD HE



Each ionizing ray (X or gamma) generates electron-hole pairs in the CdTe sensitive layer. The number of pairs is proportional to photon energy

The electric charge is collected in each pixel and managed by a CMOS circuit.

The image corresponds to the number of photons detected above the predefined energy threshold.



Advantages over Film Radiography

Compared to film, PCD HE allows, for the same image quality:

- Greatly reduced exposure times
- The use of lower-energy and/or lower-activity radiation sources
- Key benefits:
  - ISO 17636-2 compliant images with 10 times fewer photons or 10 times shorter exposure times
  - Significant reduction of scattered radiation, improving image quality thanks to energy thresholding
  - Compatible with all types of sources: radioisotopes (Se-75, Ir-192, Co-60), X-ray tubes, linear accelerators, Betatrons
  - Digital image processing with enhancement algorithms to improve quality and extract details
  - Easy duplication, archiving, and transmission of images

Composition

Transportable equipment including:

- PCD HE detector
- Laptop for acquisition control and image analysis/processing
- Power supply unit + connectors

Standard software package for:

- PCD configuration and image acquisition
- Raw image correction
- Visualization via ImageJ (analysis software – Intercontrôle add-ons in development)

Applications

- NDT/inspection of welds
- NDT/inspection of castings
- Security – explosive/illicit substance detection (bi-energy methods)
- Expertise
- Development of complete systems

© Framatome / A3199-P-FR-G-EN-202602_PCD_HE

Contact : sales.intercontrole@framatome.com
www.intercontrole.com

© [2026] Framatome. All rights reserved. This document is provided for informational purposes only and does not constitute a contractual offer or commitment. Product features, specifications, and availability are subject to change without notice. While every effort has been made to ensure the accuracy of this information, Framatome cannot be held liable for any errors or omissions. For the most current information, please contact Framatome.

framatome
Intercontrôle