

CUSTOM-BUILT SCINTILLATION DETECTORS FOR EVERY APPLICATION

Blog Post

Berkeley Nucleonics (BNC) is a leading manufacturer of [scintillation detectors](#), offering a wide range of standard and custom-built solutions to meet the needs of the most demanding radiation counting applications. Scintillation detectors are used in a variety of fields, including nuclear medicine, homeland security, environmental monitoring, and basic research.



BNC has an array of different scintillation detectors for different requirements.

Berkeley Nucleonics' custom-built scintillation detectors are designed to meet specific customer requirements, such as:

- **Size and shape:** Detectors can be made in a variety of sizes and shapes to fit into specific applications.
- **Material:** Berkeley Nucleonics offers a wide range of scintillation materials, including [NaI\(Tl\)](#), [CsI\(Tl\)](#), [BGO](#), [CeBr₃](#), and [LYSO](#). The optimal material will depend on the specific application, such as the type of radiation being detected, the energy range of interest, and the desired performance characteristics.
- **Window:** Detectors can be made with a variety of window materials, such as glass, aluminum, and beryllium. The window material will affect the efficiency and energy resolution of the detector.
- **Housing:** Detectors can be housed in a variety of materials, such as stainless steel, aluminum, and plastic. The housing material will affect the durability and cost of the detector.

Berkeley Nucleonics also offers a variety of options for custom detectors, such as:

- **Multiple detectors:** Berkeley Nucleonics can design and manufacture multi-detector arrays for applications such as PET and SPECT imaging.

- **Collimators:** Collimators can be used to focus the incoming radiation onto the detector, which can improve the energy resolution and sensitivity.
- **Light guides:** Light guides can be used to couple the detector to a photomultiplier tube or other light sensor.
- **Preamplifiers:** Preamplifiers can be used to amplify the signal from the detector before it is sent to the data acquisition system.

Berkeley Nucleonics' custom-built scintillation detectors are used in a wide range of applications, including:

- **Nuclear medicine:** Berkeley Nucleonics' detectors are used in nuclear medicine applications such as PET and SPECT imaging, which are used to diagnose and treat a variety of diseases.
- **Homeland security:** Berkeley Nucleonics' detectors are used in homeland security applications such as nuclear nonproliferation and radiation portal monitoring.
- **Environmental monitoring:** Berkeley Nucleonics' detectors are used in environmental monitoring applications such as the detection of radioactive contamination in soil, water, and air.
- **Basic research:** Berkeley Nucleonics' detectors are used in basic research applications such as high energy physics and nuclear physics.



Amongst many applications, scintillation detectors are used within medical imaging devices.

Examples of custom-built scintillation detectors:

One example of a custom-built scintillation detector from Berkeley Nucleonics is a large-area [NaI\(Tl\)](#) detector for gamma spectroscopy. This detector is used in a nuclear medicine imaging system to detect gamma rays emitted from radioactive tracers that have been injected into the patient. The detector is housed in a stainless steel housing and has a beryllium window to maximize the efficiency for detecting gamma rays. The detector is also coupled to a photomultiplier tube array to amplify the signal.

Another example of a custom-built scintillation detector from Berkeley Nucleonics is a multi-detector array for PET imaging. This array consists of 16 [LYSO](#) detectors that are arranged in a ring around the patient. The detectors are coupled to photomultiplier tubes and housed in a plastic housing. The array is used to detect gamma rays that are emitted from radioactive tracers that have been injected into the patient. The data from the detectors is used to reconstruct an image of the distribution of radioactive tracers in the patient's body.

If you're thinking about incorporating a scintillation detector into your application, BNC is well-equipped to assist you in creating a tailored solution that aligns with your unique requirements. To personalize your detector, visit this link: <https://www.berkeleynucleonics.com/customize-your-scintillation-detector>