

## Case Study: Nuclear Medicine Device Enclosure

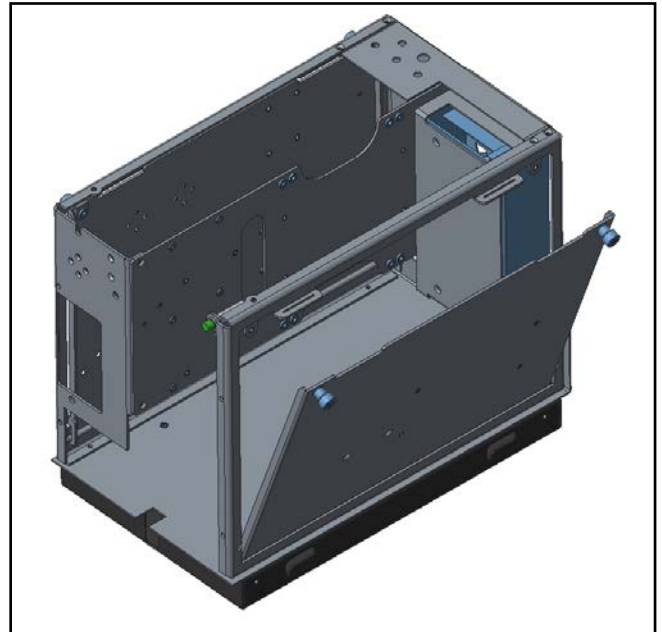
**Client:** Developer of advanced instrumentation for synthesis and detection of radio-labeled compounds for nuclear medicine

**Client Problem:** Needed a device enclosure for a next generation FDG Synthesizer that provides front panel user operation, have efficient side access, be compact for use in a standard hot cell, provide professional, high quality aesthetics, and be low-cost.

**GEOMETRIXDESIGN Solution:** Implement a complete sheet metal based enclosure design with an internal structural support frame for mounting the synthesizing system, electronic controls, and power supply and complementary brushed stainless steel and colored anodized aluminum exterior panels to provide an aesthetic and appealing design. All user access and operation for FDG synthesis is completed at the front of the enclosure. All user input synthesizing devices, solution holders, reactive solutions, and instrumentation were mounted on the front.

**Design Details:** A structural aluminum sheet metal frame was designed for supporting and mounting the FDG synthesizing elements, electronics, electromechanical hardware and controls, and power supply. The structural frame utilized a closed base pan to provide a sturdy foundation for mounting the frame structure, support feet, and a gas spring used to provide force for activation of a front handle for secure clamping of a mixing manifold. The frame sidewalls were welded to a bottom panel and attached to the base pan. A fixed center panel was used for added structural support and to subdivide the enclosure for component mounting. Fold-down side panels were used to easily access the enclosure interior. The resulting frame design provided a strong, rigid structure for

supporting and mounting all the internal system components and the fold-down panels and an open top provided easy access to the enclosure for component installation, setup, adjustment, and maintenance.



**Assembly model of the structural frame of the nuclear medical device enclosure with a partially open fold-down side panel**

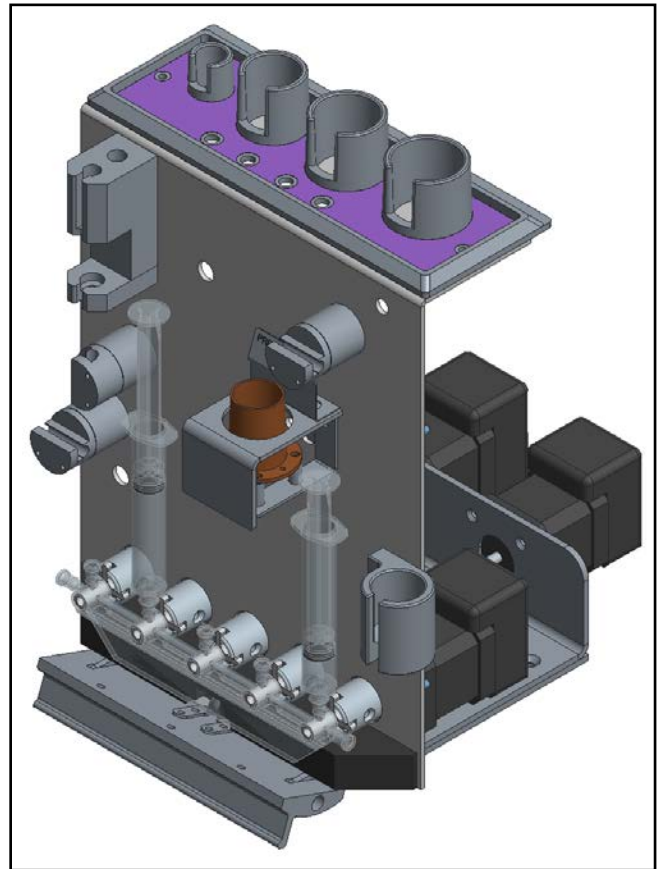
The exterior panel design of the nuclear medicine device enclosure used secure access lift-off stainless side panels and a removable aluminum top panel that allowed for complete access to the structural frame and internal components. Removal of the side panels provided access to the fold-down panels of the frame.

An aluminum front panel provided the complete user interface for the nuclear medicine device enclosure. The nuclear reactive vials were mounted along the top and the eluent, reactor heating vial, solution reservoir, syringes, and mixing manifold mounted on the front. This complete front panel operation allowed for device enclosure use in a standard radiation shielding hot cell in close proximity to other devices.

A complementary use of brushed stainless steel and colored anodized aluminum provided an appealing aesthetic for the nuclear medicine device enclosure. A fine brush finish with clear or black anodization was applied to the aluminum panels.



Figure FDG enclosure (back view)



Assembly model of front panel user interface and stepper drive components



Photo of FDG Synthesizer

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