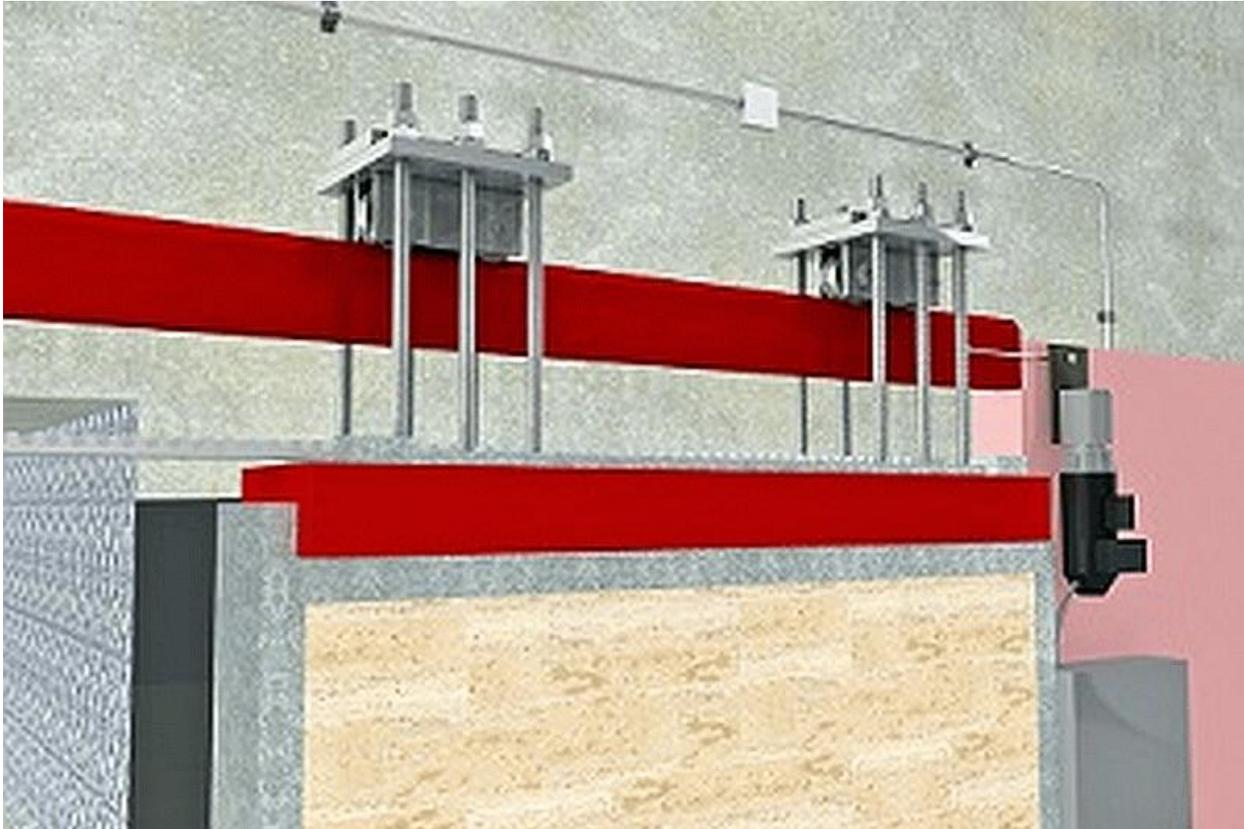


Manufacturing Engineering

"Custom Rollers Move Heavy Loads Effortlessly." Manufacturing Engineering October 2013: 50-52. Print.

Pitts Little Corp. (Birmingham, AL) is a manufacturing company specializing in the design, fabrication and installation of radiation-shielding materials for medical, pharmaceutical, governmental and industrial applications. The company, founded in 1994, works with architects, construction companies and customers as they build facilities that require radiation-shielding products.



Osborn Load Runners move heavy loads like radiation shielding doors manufactured by Pitts Little Corp. for cancer-treatment facilities, quietly and reliably.

Tom Barger, a design consultant for Pitts Little, began working to design the door systems used in radiation therapy rooms more than 10 years ago. Used in the treatment of cancer patients, the radiation therapy rooms are designed with up to 8' (2.4-m) thick concrete walls and large doors that attenuate the radiation from traveling beyond the treatment room.

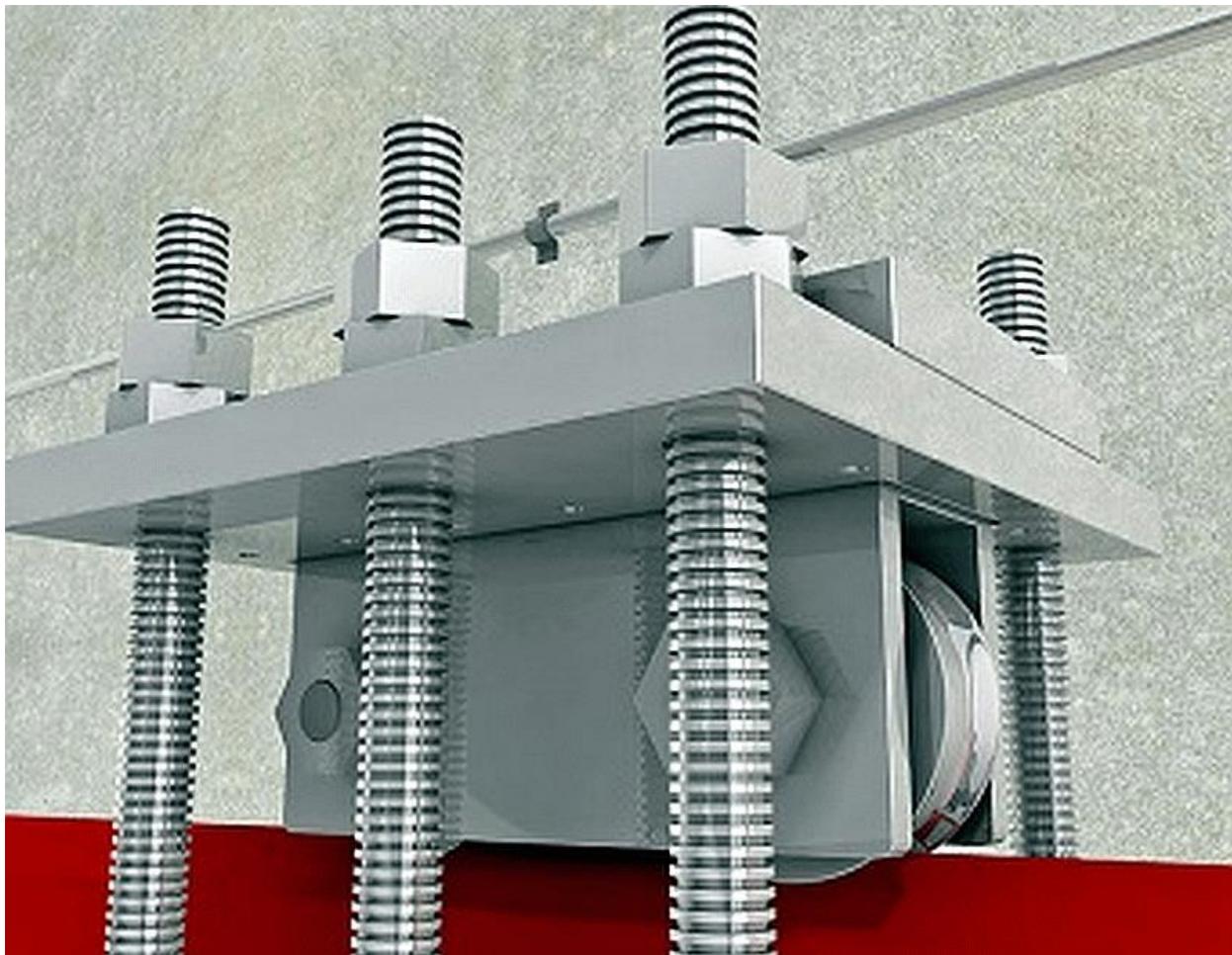
"We've manufactured and installed nearly 100 of the direct shield doors, since I've started working with Pitts Little," said Barger. "Each door, and radiation-shielded vault, is designed specifically for the needs of the customer so they vary in dimension and design. They range from 24,000

to 30,000 lb. [10,866-13,607 kg] each, and block gamma rays from entering the environment and absorb neutrons resulting from radiation treatments.”

The original design of these unique sliding doors used a style of bearing that helped the doors slide quietly open and shut, but the bearings became difficult and expensive to order. Bargeron and Walter Little, president of Pitts Little, made the decision to redesign the doors and turn to a new supplier. They contacted Osborn’s Load Runners division (Brooklyn Heights, OH) and requested a new, specialized roller from Load Runners to replace the old bearing part.

Osborn’s Load Runners division features a full line of cam followers, idler rollers and rail systems in all standard configurations: plain, flanged and v-groove. In addition to its standard products, the company designs and manufactures customized products with specialized geometries, seals, lubrication and/or materials-all exacting to customer specifications.

“I was familiar with Osborn and have used both Osborn and Load Runners’ products for the past 20 years,” said Bargeron. “I know that they make superior products that are well-designed, good looking and sturdy.”



Four custom, small-diameter, low-friction steel rollers, paired in two separate trolleys roll on an Osborn Load Runners' hard, round polished steel bar for very low-friction movement. Low friction reduces the power needed for a belt drive to move the heavy door and makes it easier to manually push or pull the door open in the event of a power outage.

“The first door that the new rollers were needed for weighed 28,000 lb. [12,700 kg] and was 2' [610-mm]-thick. It had 6" [152-mm] of solid lead to block gamma rays and 11" [279-mm] of borated polyethylene sheets that absorb neutrons inside of it,” said Barger. “It needed to slide reliably, electronically and manually, and it was imperative that it be quiet so that our customers could effectively provide patient comfort.”

Previous door designs used ballscrew actuators or chains to open and close the doors. These methods caused them to be noisy and unreliable.

Osborn's engineers designed a small Load Runners bearing to fit the specifications that Barger and Pitts Little has supplied. When the product was received, Osborn's team knew they had the equipment to produce it. After analyzing the product's application, the load it needed to carry and how smoothly it was required to operate, the engineering team was able to create a custom, small-diameter, low-friction steel roller.

“The engineering team a Load Runners worked with the specs and design needs that I sent them, and they were very responsive to us,” said Barger. “That's one of the reasons we went to Osborn with this need; they're customer-oriented and we knew that getting what needed wouldn't be a problem, even though our roller isn't a standard catalog product.”

“The door was designed to use four rollers, paired in two separate trolleys,” said Barger. “They roll on Load Runners hard, round polished steel bar for very low-friction movement. Not only does the low-friction reduce the power needed for the belt drive to move the door, it makes it easier to manually push or pull the door in the event of a power outage.”

The first door to use the custom Load Runners covers a doorway that is just over 4' [1.2-m] wide and is required to have 10" [254-mm] of overlap on both sides of the opening. It opens and closes at a slow speed with a safety bumper that stops and reverses the door's motion when bumped. The door was installed in the radiation therapy room at the new Marshall Cancer Center in Albertsville, AL.

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