

AbstractID: 7362 Title: Trends Toward the Use of Polymer-Metal Composites in Nuclear Medicine

The use of lead for radiation shielding in nuclear medical procedures and devices poses certain health risks and environmental concerns. A new line of patented, nontoxic, polymer-metal composites, trademarked as Ecomass[®] Compounds, can replace lead in a variety of applications, including radiation shielding in nuclear medicine. These compounds are thermoplastic-based, high-density composites that are injection moldable and provide comparable radiation protection to lead, but without the toxicity, fabrication, disposal and liability issues related to the use of lead. Representative applications include radioisotope containers, syringe shields and technician/patient shielding.

At present, there are eight distinct compounds available as commercial products with a similar number under development. To meet individual customer needs, these compounds can be custom-formulated across a wide range of densities (2.0-11.0 g/cc), impact strengths, tensile strengths, and heat-deflection temperatures. The compounds can be electro-plated or powder-coated to improve appearance and wear resistance.

The use of these compounds can eliminate the introduction of toxic materials, such as lead, into clinic and hospital settings while providing required radiation protection at a fraction of the cost of other nontoxic shielding materials. Costs for nuclear medical devices that employ these compounds can be reduced by the elimination of substrates, support castings and some labor costs, all of which can translate into reduced shielding costs.

This paper will present test data that confirms the compounds' shielding properties and will outline their advantages in nuclear medical applications. Development of these compounds is funded by Ecomass[®] Technologies, a division of Ideas to Market, L.P.