

# ECOMASS<sup>®</sup> COMPOUNDS

*NONTOXIC SOLUTIONS FOR HIGH DENSITY MATERIAL APPLICATIONS*



## OVERVIEW

Ecomass<sup>®</sup> Compounds are a new line of patented nontoxic thermoplastic composite materials that can replace lead and other traditional materials in many applications.

Ecomass<sup>®</sup> Compounds can be formulated with densities up to that of lead (11.0 g/cc) but, unlike lead, these compounds are completely nontoxic and can meet some of the most demanding physical property requirements utilizing a variety of polymers and fillers. Best of all, Ecomass<sup>®</sup> Compounds can be injection molded on conventional molding equipment and a new line of extrudable compounds has been developed for sheet and film applications.



Ecomass Technologies supplies Ecomass<sup>®</sup> Compounds and is a total resource network, delivering finished products to leading companies on a global basis. Ecomass Technologies assists its customers with material selection, part design, prototyping, production and contract manufacturing.

Over twenty Ecomass<sup>®</sup> Compounds are commercially available and compounds are continually being developed for weighting, balancing and radiation shielding products.



In almost any application where a high density material is required, Ecomass<sup>®</sup> Compounds can be used without the toxicity concerns of lead.

## Current Applications using Ecomass<sup>®</sup> Compounds

Training Projectiles  
X-ray Tube Housings  
Rad Waste Shielding

Balance Weights  
Isotope Shipping Containers  
Golf Club Weighting

Cable Sheathing  
Reactor Shielding  
Fuel Valve Weights



## **ECOMASS<sup>®</sup> COMPOUNDS CAN REPLACE LEAD AND OTHER TRADITIONAL MATERIALS**

Ecomass<sup>®</sup> Compounds do not contain lead, lead compounds, or any material considered toxic or hazardous according to the *U.S. Department of Defense Listing of Toxic Chemicals, Hazardous Substances and Ozone Depleting Substances* or the U.S. Environmental Protection Agency's (EPA) *Hazardous Substances Priority List*. Several Ecomass<sup>®</sup> Compounds have met the requirements of ISO 10993-5, Biological Evaluation of Medical Devices, Part 5.



Ecomass<sup>®</sup> Compounds have also been evaluated for RCRA characteristics and do not meet the criteria of a hazardous waste if discarded in their purchased form. Additionally, Ecomass<sup>®</sup> Compounds will not become a "Mixed Waste" if contaminated with a radioactive waste.

Lead is ranked number one on the U.S. EPA's Top 20 Hazardous Substances Priority List. Disposal of lead-contaminated soil or waste that contains lead (both now classified as a hazardous waste in concentrations at or above 5mg/L) is very expensive. In accordance with RCRA land disposal restrictions, lead-contaminated soil must be placed in a hazardous waste landfill.

EPA Lead Standard limits lead in drinking water to 0.015 mg/L and currently requires 79,000 public water suppliers to monitor lead levels at household taps. Lead is a cumulative poison that can be ingested, inhaled, or absorbed through the skin. Lead is toxic to the central nervous system, kidneys, cardiovascular system, and developing red blood cells at blood levels as low as 10 mg/dL. Lead is especially toxic to developing fetuses and children. It causes delayed development, diminished intelligence, and altered behavior. Severe toxicity can cause sterility and abortion, as well as neonatal mortality and morbidity. Growing scientific evidence and public awareness of lead's toxicity has provoked increasingly stringent regulation and prohibition of the use of lead in North America and Europe.

### **THE ORIGIN OF ECOMASS<sup>®</sup> COMPOUNDS**

The original Ecomass<sup>®</sup> Compound was developed for the U.S. Army for use in nontoxic training ammunition to address the problem of increasing lead contamination of the soil and groundwater at U.S. Department of Defense (DoD) firing ranges. DoD liability for remediation of lead-contaminated firing ranges exceeds \$600 million and EPA has successfully enforced several range closures as a result of excessive lead levels in groundwater. Since that time, more of the services as well as law enforcement agencies have benefited from lead-free ammunition.



### **Ecomass Technologies**

Ecomass Technologies works with composite material processors and OEMs to develop specific formulations that meet their needs for nontoxic, high density materials. With the dramatic escalation in disposal and remediation costs of lead-contaminated and other toxic wastes, Ecomass

Technologies can provide solutions for companies determined to meet current and future environmental challenges head on.

## Frequently Asked Questions:



### **Q: What are Ecomass<sup>®</sup> Compounds?**

**A:** Ecomass<sup>®</sup> Compounds are a patented line of engineered thermoplastic composite materials designed to replace traditional, high-density materials such as lead and other metals. Ecomass<sup>®</sup> Compounds can be custom formulated to meet a wide range of customer requirements, balancing key properties such as density, tensile strength, impact strength, heat deflection temperature and more. Unlike most metals or alloyed materials, Ecomass<sup>®</sup> Compounds can be processed on typical thermoplastic equipment (including injection molding presses and extruders) to form parts and shapes to satisfy customer demands for high-strength, high-density, composite materials. Certain grades of Ecomass<sup>®</sup> Compounds can be electroplated and powder coated.

### **Q: Can Ecomass<sup>®</sup> Compounds be used to replace lead and other heavy metals in all applications?**

**A:** One of the primary formulations of Ecomass<sup>®</sup> Compounds is a tungsten/polymer composite. As such, for many of the applications that rely on the chemical properties of lead or other metals (such as automobile batteries), Ecomass<sup>®</sup> Compounds would not be a suitable alternative. However, the physical properties of Ecomass<sup>®</sup> Compounds are superior to lead in almost all aspects. For radiation shielding applications and weighting or balancing applications where large volumes of close tolerance parts are required, Ecomass<sup>®</sup> Compounds can be a smart, environmentally friendly, cost effective solution.

### **Q: Can Ecomass<sup>®</sup> Compounds be molded and extruded with standard equipment?**

**A:** Yes, Ecomass<sup>®</sup> Compounds were designed to process on conventional injection molding and extrusion equipment. Barrel and nozzle temperature profiles are very similar to other filled compounds. Injection molders who have molded Ecomass<sup>®</sup> Compounds indicate that they process better than many fiberglass-filled materials they have been molding for years.

### **Q: How are Ecomass<sup>®</sup> Compounds produced?**

**A:** Ecomass<sup>®</sup> Compounds are produced using our unique compounding capabilities with highly filled thermoplastic composites. The highest quality assurance standards insure that density and other physical property requirements are maintained throughout the compounding process, resulting in molded parts and extruded sheet that will fully satisfy the most stringent customer specifications.

### **Q: I have some very specific physical property requirements. Can Ecomass<sup>®</sup> Compounds be formulated with different resins to meet these requirements?**

**A:** Yes, depending upon the specific balance of properties required for your application, a number of different base polymers and fillers can be combined to tailor an Ecomass<sup>®</sup> Compound to suit your needs. Our capabilities in custom compounding, along with our ability to formulate and test an almost unlimited

number of resin and filler combinations, means we can meet the most demanding or unusual requirements of your particular application.