



# **AlphaGary Corporation**

## **Toxics Use Reduction Case Study**

### **AlphaGary reduces use of Lead Compounds**

#### **Summary**

In 1998, the AlphaGary Corporation ([www.alphagary.com](http://www.alphagary.com)) successfully launched a Lead Reduction Pilot Program, in which they evaluated the use of alternatives to lead compounds in their products, while producing materials of equivalent or improved quality. This evaluation allowed the company to successfully incorporate these alternatives into their design process, thereby reducing the amount of time to bring new products to market. By 2004, the company experienced a 30% reduction in the use of lead and lead compounds, as well as reducing other toxic materials such as cadmium compounds and other heavy metals.

#### **Background**

The AlphaGary Corporation has a manufacturing facility in Leominster, MA. AlphaGary develops and manufactures specialty PVC and halogen-free compounds; including a variety of TPE elastomer alloys. They produce plastic compounds for a variety of end uses including wire & cable, automotive, consumer goods, packaging, and other applications. The company employs 170 people at their Leominster facility and about 400 worldwide.

#### **Toxics Use Reduction**

Because of changes in the market conditions influenced by European-legislated restrictions and other environmental regulations that required companies to restrict or prohibit the use of lead in their products, AlphaGary decided to take a proactive approach and design their compounds for the wire and cable industry without using lead and cadmium. AlphaGary investigated less toxic materials by applying toxic use reduction techniques, taking into consideration cost and performance factors as well as impacts on the environment and worker health and safety in the design criteria. These R&D efforts led the company to suitable, less toxic alternatives. Through extensive study and product testing, that involved their customers, including representatives from the telecommunications industry, AlphaGary found replacements for lead in their wire and cable products. The lead compounds used as heat stabilizers in many of their formulations were replaced with calcium-zinc and barium-zinc substitutes, with no loss of product quality or performance either from a functional or fire safety perspective.

Early R&D success allowed the company to adopt a policy of not using lead in any newly developed products unless their customers specifically required it or if the end use requirements could not be satisfied without it. In order for the company to improve their competitive advantage, they needed to develop greater internal capabilities for product design, evaluation and testing. The revised testing process required significant investment in analytical instrumentation including DSC, TGA, XRF spectroscopy and cone / bomb calorimetry. These analytical techniques measure heat release rates and fuel loads that helped to predict fire performance. These tools ensured not only greater development capabilities but also accelerated product certification through the Underwriters Laboratories (UL) or other third-party Listing processes. (The UL process requires that wire and cable manufacturers achieve Listing approvals to meet certain safety and end-use performance criteria.) Switching from lead and lead compounds AlphaGary required few if any adaptations in their manufacturing equipment.

AlphaGary is also an active participant in the Wire and Cable supply chain meetings sponsored by the Toxics Use Reduction Institute. The supply chain effort brings industry clusters together, providing opportunities for networking, education and shared knowledge to help Massachusetts business reduce toxics in products and maintain global market leadership. These meetings help AlphaGary better understand industry trends and stay ahead of changes in regulations. Specifically, participation in the supply chain effort helped them develop strategies to reduce lead from their manufacturing process.

## **Results**

### *Reductions:*

In total, AlphaGary lowered their use of lead compounds by 30%, a significant reduction. To achieve these results, the company successfully applied toxic use reduction methods and strategies involving several different departments including R&D, Purchasing, Marketing, Sales, Engineering, Quality, Maintenance, and Production. Working with its suppliers, AlphaGary was also able to change the packaging for many of its lead-based raw materials. This change significantly reduced the risk of handling lead-based materials and decreased emissions. AlphaGary continues to work with UL and their customers to accelerate acceptance and preferences for new polymer compounds with lower or no lead compounds in their formulations and to reduce the use of lead compounds and other toxics.

### *Economics:*

AlphaGary allocated significant R&D resources developing new product formulations to replace lead and lead compounds. From 1998 to 2002, along with the human resources, AlphaGary estimates it invested in excess of \$1,000,000 for analytical equipment as well as customer evaluations and UL Listing approvals for the lead-free products. (The cost to achieve a third-party cable Listing is approximately \$8,000 per cable.) The result of the investments of time and money significantly reduced the amount of effort to develop and qualify new products. In short, they are able to bring new products to market faster. Lead reduction efforts continue as customers respond to market drivers. The reductions in lead use and increase in manufacturing efficiency have allowed AlphaGary to benefit on this investment by maintaining its capability as a technology leader and to retain its competitive global supply position to its customers.

This case study is one in a series prepared by the Office of Technical Assistance (OTA), a branch of the Massachusetts Executive Office of Environmental Affairs. OTA's mission is to assist Massachusetts facilities with reducing their use of toxic chemicals and/or the generation of toxic manufacturing byproducts. Mention of any particular equipment or proprietary technology does not represent an endorsement of these products by the Commonwealth of Massachusetts. This information is available in alternate formats upon request. OTA's **non-regulatory** services are available at **no charge** to Massachusetts businesses and institutions that use toxics. For further information about this or other case studies, or about OTA's technical assistance services, contact:

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