

The following is a case study I wrote on contract for a marketing agency:

Polycarbonate Enclosures Take a Beating So Critical Electronics Can Go on Working

Company A Enclosures Stand Up to 15 Years of Outdoor Stresses

When electric motor controls leave Company B's ****, Ohio, facility, it's uncertain the type of environment they'll be used in. Some control fire suppression systems inside buildings. But many end up outdoors—to control agricultural irrigation systems or oils wells, for instance—exposed to sun, water and impact.

No matter their destination, the electronic controls leave encased in polycarbonate enclosures made by Company A. From 15 years of experience using Company A enclosures, Bill Edwards, President of Company B, has learned that his control systems are well protected against whatever environmental stress they encounter.

“With Company A enclosures, we know that we will get better longevity out of our products, and our customers get a better experience because of the protection,” Edwards explains. The enclosures typically outlast the lifetime of the electronics they protect—some lasting 15 years, since Company B became an Company A customer.

Polycarbonate Enclosures Pass the Test

Early on in Edwards' relationship with Company A, one of Edwards' customers questioned his recommendation to use Company A's polycarbonate enclosures. The customer dismissed the enclosures as “plastic boxes.”

So, for his own assurance as much as his skeptical customer's, Edwards placed one of the enclosures on the ground, backed his half-ton pickup on it, stopped for a minute, then drove off it. It survived without a crack. Similarly, Company A has held up well for the past 15 years as Company B's enclosure of choice for a wide range of applications that involve harsh environmental and operating conditions. Among polycarbonate's most significant characteristics:

- Impact resistance—as Edwards proved—that is far superior to other plastics and even stainless steel
- Corrosion resistance, even in marine applications

Company B commonly uses the enclosures for oil and gas, construction, chemical, manufacturing, refining and wastewater treatment applications, where they encounter a lot of abuse. In applications in isolated areas, Company A polycarbonate enclosures have on occasion even resisted the impact of a bullet to protect Company B's electronic boards. “Maybe not a high-caliber bullet, but a .22,” Edwards said.

Polycarbonate also protects electronics from the violent vibrations of 600- to 700-horsepower rock crushers that tear up roads— “one of the highest vibration operations in our line of work,” Edwards said.

Polycarbonate, a polymer produced by the reaction of bisphenol A and phosgene, has many other desirable qualities: excellent electrical insulation, heat resistance, UV resistance (bolstered by the addition of UV stabilizers) and fire suppression (with flame retardants added by Company A).

In addition, polycarbonate is lightweight—a real plus for technicians who install fire suppression units in high-rise buildings (three pounds for a polycarbonate-enclosed unit, compared to 15 pounds for metal) or when used in large numbers, as they are for electrical systems on ships or aircraft, where weight is an issue.

Polycarbonate Flexes Its Muscle in New Markets

Another major advantage of polycarbonate is its adaptability to new products. Company B started out 25 years ago specializing in engine control and monitoring systems for generator set applications. That business grew steadily. And in the last 10 years, Company B has expanded to new markets, such as:

- Agricultural irrigation systems
- Marine propulsion and marine power generation controls

Edwards says that Company A has adapted right along with his company’s new pursuits, investing in development of new, smaller enclosures to house controls for the new marine systems. He explained that polycarbonate is easier than other materials to modify to the unique wire access requirements of each application. “You can run a drill through polycarbonate like butter,” says Edwards. And unlike fiberglass, polycarbonate creates no harmful-to-breathe particles when it is drilled.

A few of Company B’s customers still insist on sheet metal enclosures, as that’s what they’re used to working with. But for all other customers, Company B uses Company A enclosures. They stand up to the half-ton pickup test, but more important, they provide protection against the common rigors of outdoor applications—water, sun and impact—for the lifetime of the electronic units they protect.