



# Compounding Lines

Your Global Compounder of Custom Engineered Thermoplastics



## Engineered POWER

Compact, high density lithium-ion battery delivers reliable energy wherever it's needed

R.W. Beckett Corporation has been a leader in the HVAC industry for more than 75 years. In 2010, looking to diversify their business and seeing an opportunity to leverage their extensive manufacturing expertise and electronic control technologies in a complementary industry, Beckett created a new division, Beckett Energy Systems, to commercialize an exciting lithium-ion (Li-ion) battery technology that was under development.

The ultimate product promised to be revolutionary—1.1 kWh of energy storage in a battery only 23.5" long, 8.25" wide and 2.25" high, and weighing in at a mere 17.5 pounds, opening up a wide world of application possibilities.

*"No other lithium-ion battery offers this level of energy density, in so small and lightweight*

*a package,"* said Beckett Energy Systems Product Manager Brad Moore. *"By contrast, to deliver 1.1 kWh, a lead acid battery would be four times the size."*

According to Moore, a key link in the development of the large format, high density Li-ion battery was the design of an effective case. A complex moldable shape was needed to effectively contain and provide optimum stability for the 56 individual cells. It required just the right material to construct it.

*"It was a tall order—it had to be highly moldable, high strength, impact resistant and flame retardant,"* explained Moore.

Part of the challenge was that the end product needed to be readily shippable by a variety of means in order to reach custom-

ers around the world, even those using the batteries at sea or in remote areas. However, in order for Li-ion batteries to be allowed on planes, ships, trains, and most other forms of transport, they need to meet the safety requirements of United Nations section 38.3, which mandates that the product undergo a series of six stringent tests. These include severe vibration, followed by a 150G impact shock test on all six sides of the case, not to mention 6-12 hours under temperature extremes from -40°C to +75°C (-40°F to 167°F), an overcharge test and short circuit test.

The chosen compound, of course, would need to support the design in order to protect the integrity of the cells under all of these extreme exposures.

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Senior Process Engineer Jeff Traczek got the names of several plastics compounders and entered discussions with them. But, he said, all but one compounder soon fell by the wayside.

*"RTP Company was far and away the most responsive; they always got back to us right away with samples and the answers to our questions, and the answers were always good and helpful ones,"* said Traczek.

Using their Chinese facility, Beckett began molding with an RTP Company flame retardant (UL94 V-0) polypropylene. But soon, notes Traczek, RTP Company got another opportunity to demonstrate their responsiveness.

*"We were getting warped parts; I called RTP Company and asked them if they could get someone to our Chinese facility to help the molder optimize the process,"* he said. *"They stepped right in, and we were producing good straight parts in no time."*

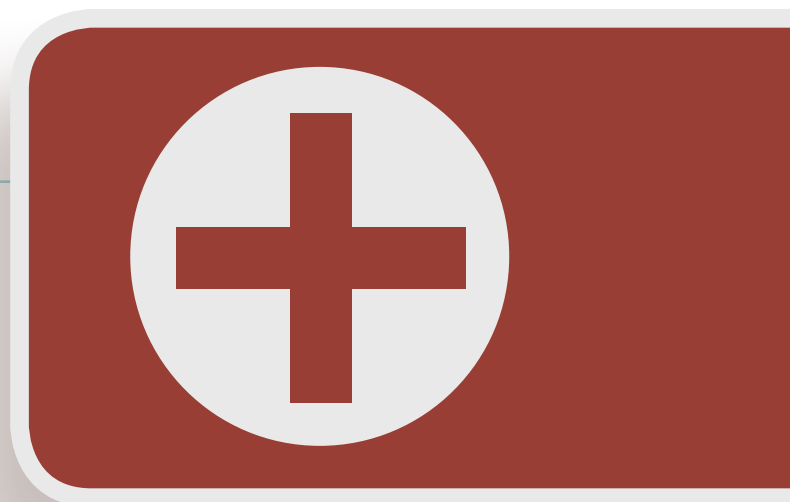
The new battery passed all the required tests and was recently commercialized, and the Beckett Energy Systems team has been working on developing new markets for the innovative high power/lightweight power source. Early indications have been extremely positive, with a clearly demonstrated market need for the revolutionary new battery in a wide variety of applications.

*"We really appreciate the proactive assistance we get from RTP Company. They are always responsive and always willing to go the extra mile,"* said Traczek. *"Those are the kind of people that make your job easier, and the kind of people that you want to be working with."*

### LI-ION Battery Module

**Market:** Energy

**Compound:** RTP 100 series glass reinforced Polypropylene (PP) modified with flame retardant additive package.



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