Born of Destruction

MINIMIZER'S TOUGH SEMI FENDERS BENEFIT FROM BLACK ULTEM PROTOTYPES

"As trucks change, we need to change. People are always coming to us for new products."

– Craig Kruckeberg, Minimizer CEO

CASE STUDY

If necessity is the mother of invention, sometimes destruction is its father. This was the case with the tough-as-nails semi-truck fenders that Minimizer designs and manufactures in its Blooming Prairie, Minnesota, facility. The idea for these thick-gauge polyethylene fenders came from a pair of accidents: An errant forklift dented Dick Kruckeberg's metal semi fender and, later, Dick's wife flattened a plastic garbage can with her car. The metal fender was ruined; the garbage can popped right back into shape. Three generations of Kruckebergs have been designing and manufacturing flexible, durable, lightweight polyethylene fenders ever since.

Minimizer prides itself on constantly improving products and incorporating customer feedback. The latest challenge is to enter the growing market of truck owners using fuel-efficient super-single tires. On these rigs, one wide tire on each side takes the place of two narrow ones. This lighter-weight configuration allows drivers to haul more payload and reduces rolling resistance so trucks go farther on less fuel, according to Minimizer mechanical engineer Martin Larsen.

Making narrower fenders and the bracket assemblies that go with them means creating all-new tooling — a big investment. It's crucial for Larsen to get the designs right before committing to tooling, so functional prototyping is essential. And in Minimizer's trademark rugged testing environment, Fused Deposition Modeling (FDM®) is the only 3D printing technology up to the task. Its real engineering thermoplastics include ULTEM* 9085, the all-around toughest rapid-prototyping material in terms of mechanical strength and resistance to heat and chemicals.

With Minimizer's onsite Fortus® 3D Production System, Larsen can build functional prototypes in just hours or, for large parts, days. And now that Stratasys offers ULTEM in black, those parts are right at home on the shop floor, masking grease and fingerprints and taking abuse with no painted finish to scuff and scratch.

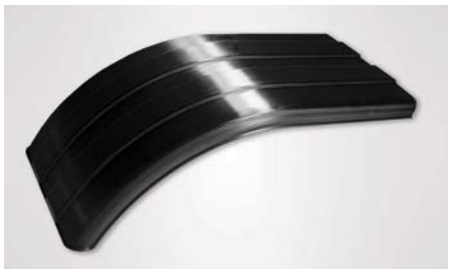
In the truck bay outside his office, Larsen drills into a black FDM prototype of the super-single fender he's developing and bolts it to a truck with its bracket assembly (also an FDM prototype) to verify alignment and clearance. "I look at it in CAD, but it's hard to be sure until you get the prototype on the truck and make sure it's the form you want," he says. On a dirt road nearby, the FDM part holds up to a dusty ride, with gravel flying.

The material's new black color also offers Minimizer the chance to make concept models look more like production parts. "About 90 percent of our products are black in this industry," says Minimizer CEO Craig Kruckeberg. Black ULTEM models look like the real thing right out of the build chamber, which is helpful for a business that's constantly trying out new ideas.

"As trucks change, we need to change. People are always coming to us for new products," Kruckeberg says. Now that its fenders are indestructible, it is customer needs that drive Minimizer to keep inventing.

Check out video footage of Minimizer testing its super-single fender assembly in black ULTEM at Stratasys.com/blackULTEM.

ULTEM's rugged qualities make it useful in environments where axle grease, oils and road grime are pervasive. The new black color helps it blend right in.



Minimizer performed functional prototyping with this black FDM fender assembly.

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