exothermic

Reaction Injection Molding

Case Study: Brooks Automation - 70% Cost Reduction and Weight Savings Achieved as the RIM Process Replaces Aluminum

Brooks Automation is a leading supplier of wafer handling automation for the semiconductor industry. Their Loadport Cart is a modular component used with numerous versions of their high-tech equipment. The original design of the Loadport Cart included a three-piece machined aluminum assembly. The critical feature of the product was its ability to support an expensive 100-pound component when used within the clean room processing environment. The fabricated metal part became too expensive, too heavy and too difficult to produce.

Brooks Automation turned to Exothermic Molding and the Reaction Injection Molding Process to improve their product. Exothermic assisted Brooks in designing and creating a one-piece molded part to replace the three fabricated metal pieces. The 1/2" thick molded walls and rib sections create a robust molded part capable of replacing the metal assembly. The replacement of aluminum with solid RIM polyurethane reduced the cart's weight by 10 pounds (from 15 pounds to 5 pounds) with no compromise in strength or structural integrity. Labor costs are reduced due to component consolidation and having Exothermic Molding supply various hardware workings while completing secondary assembly operations. The RIM design achieved a 70% cost reduction. Brooks Automation now purchases a single part number versus 20 individual component parts, saving additional time and overhead expense.

The Loadport Cart molded in RIM is 70% less expensive, 10 pounds lighter, and reduced the purchased part count from 20 to 1. Delivery time is short and production volume is high.

Note: Tooling costs were fully recovered after the production of just 30 assemblies.

Reaction Injection Molding is swiftly becoming the process of choice for certain project requirements. The RIM method is replacing Thermoforming, Cast Urethane, Thermoplastic Injection, Structural Foam, Fiberglass, Sheet Metal, and Cast Aluminum.

Exothermic Molding delivers large, lightweight RIM parts quickly...at competitive prices.

The benefits of reaction injection molding include:

- *Large, sculpted parts can be molded economically.*
- *Variable thickness walls within the same mold allow for greater design freedom. Wall thickness may range from .125 to 1.125 inches.*
- *Closed molds produce accurately molded and structurally strong parts.*
- *Lower tooling cost and shorter tooling lead time.*
- *A wide variety of material properties including UL94VO.*
- *Electronic components, metal parts, glass and other materials are easily encapsulated.*
- *RIM parts are lower cost than the same parts made from metal or fiberglass.*
- *Compared to fiberglass, RIM parts have improved repeatability.*
- *Composites - RIM parts can be reinforced with many materials.*

Exothermic Molding capabilities:

- **CAD Engineering Review**
- **Mold Design**
- **Mold Manufacture**
- **Mold Repair/ Modification**
- **RIM Molding**
- **Precision Painting**
- **Silk Screening**
- **Assembly**

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Exothermic Molding is an ISO 9001:2015 Certified company.