

## Market – UHB LED Devices and MEMS

## Meeting Tight Tolerances on High Volume Production Runs

Spectrum Plastics Group provides engineering and manufacturing services to lighting, electronic, communication, medical and automotive industries that use LED and MEMS packages.

### UHB LED Devices (Ultra-High Brightness, Light Emitting Diode)

Spectrum Plastics Group has manufactured thermoplastic optical lens and open cavity packages for the LED industry for over 10 years. Our engineering expertise and technology advancements in this industry continue to provide the market leaders with the required technology to meet the challenging demands of the emerging and growing LED industry.

Our LSR molding “white room” cell provides a clean room atmosphere and clean room enclosed molding systems that provide world class LSR (liquid silicone rubber) lens on lead-frame and loose piece lens production. Meeting the high temperature reflow solder requirements and providing tight tolerance products at high volumes in the UBH-LED device market continues to be a core technology. Developments in materials, new processes and tooling continue to provide exceptional quality and cost benefits for our customers.

In-line automated insertion of heat sinks for thermal management and chip mounting are integrated in-line on our reel-to-reel automated molding systems. Spectrum Plastics Group implements continuous improvement processes to maximize output and productivity to remain globally competitive.

UB LED products are used in back lighting for large screen LCD TV's, mobile handsets, automotive headlights, general lighting and exterior architectural lighting. Spectrum Plastics Group continues to provide technology leadership in process, equipment and engineering to support the continued growth in this industry.

### MEMS (Micro-lectro-mechanical-systems)

MEMS devices are grouped into two major classifications: sensors and actuators. Sensors sense a variety of parameters, from rotation to chemicals. Actuators are much more mechanical in nature. Spectrum Plastics Group has focused engineering and development of reel-to-reel molding systems in the sensor device technologies.

These sensor technologies are inertial sensors, which are comprised of gyros and accelerometers and pressure sensors. For the past 7 years, Spectrum Plastics Group has been meeting the needs of their global MEMS customers by providing high volume injection molded open cavity packages and lid applications.

Our reel-to-reel production capabilities of in-line automated feed systems, in-line pre/post stamping operations, continuous in-line vision inspection and our packing systems make Spectrum Plastics Group a competitor that provides superior quality and excellent cost to performance. We serve customers in the Industrial (Heat Sensors), Automotive (Stability Sensors), Marine (Gyroscopes) markets as well as other markets requiring low cost precision over-molded packages.

High temperature thermoplastics such as LCP and PEEK are processed on our vertical/vertical molding equipment, which provides a lower cost alternative to classical MEMS ceramic and cast processes. Let the Spectrum Plastics Group provide you with engineering services from prototype to high volume production.

### Reel-to-Reel Molding

Spectrum Plastics Group has developed reel-to-reel continuous strip feed molding where tight-tolerance repeatability, artificial-vision inspection, and precision tooling is required on non-metal strips. Reel-to-reel molding is best suited to supply high volume (over one million pieces) consumer product manufacturers with precision components in a method to enhance the efficiency of their high-speed automated assembly equipment. Spectrum Plastics Group has built 64-cavity tools capable of producing 15,000 pieces per hour.

High volumes and small components molded on a Mylar™ carrier strip are reeled onto large capacity plastic reels that provide protection for the components and allow product to be introduced at the proper orientation into an automated assembly process. The reel-to-reel molding method offers a solution to eliminate problematic bowl feed applications of plastic components, which require precision location and alignment in a high-speed assembly environment.

Metal strips for the reel-to-reel molding are more common and can be in any number of highly conductive materials, from stainless steel to copper or gold-plated materials. Depending on the product, the metal strip provides a function, like a connector, which is incorporated into the product by this unique and high precision process. Spectrum Plastics Group has developed several advancements in this technology, including LSR domes for high heat LED applications.



**Our full service capability acts as an extension to your current engineering and manufacturing by providing the following group of services:**

### Design & Engineering Services

- Rapid Prototyping (SLA, LS, RTV Castings, CNC Machining)
- Rapid Tooling (aluminum, P-20, or hardened steel)
- Product Design Support
- Design for Manufacturability and Assembly (DFM & DFA)
- MoldFlow Analysis
- Resins / Materials Expertise
- Tool Design and Build
- Molding Process (developed and validated utilizing decoupled/scientific molding methodology)
- Gage R & Rs
- Value Analysis / Cost Reduction
- Secured Electronic Communication

### Manufacturing Services

- Injection Molding, Insert Molding, Over-Molding, Reel-to-Reel Molding, and Liquid Silicone Rubber (LSR) using Liquid Injection Molding (LIM) Technology (all available for low, medium and high volume production)
- Advanced CNC Plastic Machining (including tight tolerances, critical features and non-moldable geometries)
- Assembly & Sub-assembly (manual, semi-automated or automated)
- Stringent Process Qualification & Validation Methods (in process, on-going, and final testing as required)
- Molding Process (developed and validated utilizing decoupled/scientific molding methodology)

### Value-Added Services

- Decoration (pad printing, hot stamping, screen printing, painting and decal application)
- Adhesive, Heat, Spin, Vibration, Solvent and Ultrasonic Welding
- Annealing
- EMI and RFI shielding
- Electro-less & Electrolytic Plating
- EM (Electro-mechanical) Assembly
- General Assembly (manual and semi-automated)

### Quality Certifications

- ISO 9001:2000

To find out more, go to: [www.spectrumplasticsgroup.com](http://www.spectrumplasticsgroup.com)

### Have a project you'd like to discuss?

Contact at us at [sales@hq.spectrumplasticsgroup.com](mailto:sales@hq.spectrumplasticsgroup.com)



### One Stop... Taking Plastic from Prototype through Production

- Design & Engineering
- Design for Manufacturability
- Rapid Prototyping
- Rapid Tooling
- Tool Design & Build
- Injection Molding Technologies
- Value-Added Services

### Certifications

- ISO 9001:2000

## SPECTRUM PLASTICS™ GROUP

### Rapid Prototyping Divisions

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