CASE STUDY

Die Casting:
Eliminating Porosity and Improving Cleanliness with Plunger Beads

POLY SLICK™ 76-P

The Challenge

A major global die caster of small engines for the lawn and garden industry was looking to replace their plunger lubricant. The customer was using a water-based oil and graphite plunger tip lubricant and had been experiencing issues with housekeeping, overspray areas on die cast machines and safety issues with dirty, slippery floors. They felt that besides the mess, the product may have been contributing to porosity issues with the castings and reduced tip and sleeve life. The customer approached Quaker Houghton for a solution including:

- Improved cleanliness
- Increased safety
- Elimination of porosity issues
- Plunger tip and sleeve life improvement

The Solution

Quaker Houghton recommended POLY SLICK™ 76-P 1.0 – 1.5 mm plunger beads. This solution was chosen because plunger beads create less carbon build-up than traditional plunger lubricants, resulting in cleaner working environments. Also, POLY SLICK™ 76-P demonstrates strong adherence to the plunger tip, extends tip and sleeve life with excellent boundary lubrication, and reduces cycle times.

To offer precise feeding of the plunger beads, Quaker Houghton installed the POLY SLICK™ Bead Dispenser equipment, a custom designed applicator compatible with Quaker Houghton's line of wax bead plunger lubricants.

The outcome of the trial met all of the customers requirements and the customer now has better control of the process via bead dispensers and less downtime due to housekeeping issues.

Custom designed POLY SLICK™ Bead Dispenser equipment and POLY SLICK™ Plunger Beads

Creating Sustainable Value (CSR)

Quaker Houghton focuses on providing customer solutions that reduce waste, energy, water usage and chemical consumption, while improving operational processes, tool life and the health and safety of workers. We are committed to creating a positive social, environmental and economic impact on our world. By converting to POLY SLICK™ 76-P the customer experienced a reduction in smoke helping to improve the air quality for workers. Cleanliness was a big problem for the customer, after switching to POLY SLICK™ 76-P the customer no longer had greasy floors, dirty machines and ceilings, or messy spills which lowered the safety hazard for slips and falls. This also improved operational efficiency by reducing downtime from frequently cleaning the machines and work area.

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The Benefits

By switching their plunger lubricant to POLY SLICK™ 76-P, the customer achieved the following results:

- Bright and clean castings with no grease or stain marks
- Cleaner machines, ceilings and floors eliminating slipping hazards
- Improved process control and lubrication of the tip and sleeve using bead dispensers
- Reduced porosity
- Doubled tip and sleeve life
- Improved air quality for workers

Process and Equipment

PARTS	ENGINE COMPONENTS: SUMPS, HEADS, CYLINDERS AND RODS
Operation	High pressure die casting
Material	380 Aluminum
Machine	Lester and Buhler Prince die cast machines
Shot Tip Material	Copper Beryllium
Plunger Tip Diameter	4 inches

The Product

POLY SLICK™ 76-P is a beaded, dry-form plunger lubricant designed as a high performance substitute to oil-based lubricants. This product is formulated with a unique blend of the highest quality waxes and additives for rapid wetting and excellent boundary lubrication, allowing for increased shot velocities and extended tip and sleeve life. POLY SLICK™ 76-P plunger beads create less carbon build-up than traditional oil-based plunger lubricants, resulting in cleaner die cavities and machines, along with less porosity. POLY SLICK™ 76-P contains graphite for enhanced lubrication and thermal resistance to meet the demands of your process. The amount of POLY SLICK™ 76-P applied is dependent on the size of the plunger tip and the weight of the casting produced.

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