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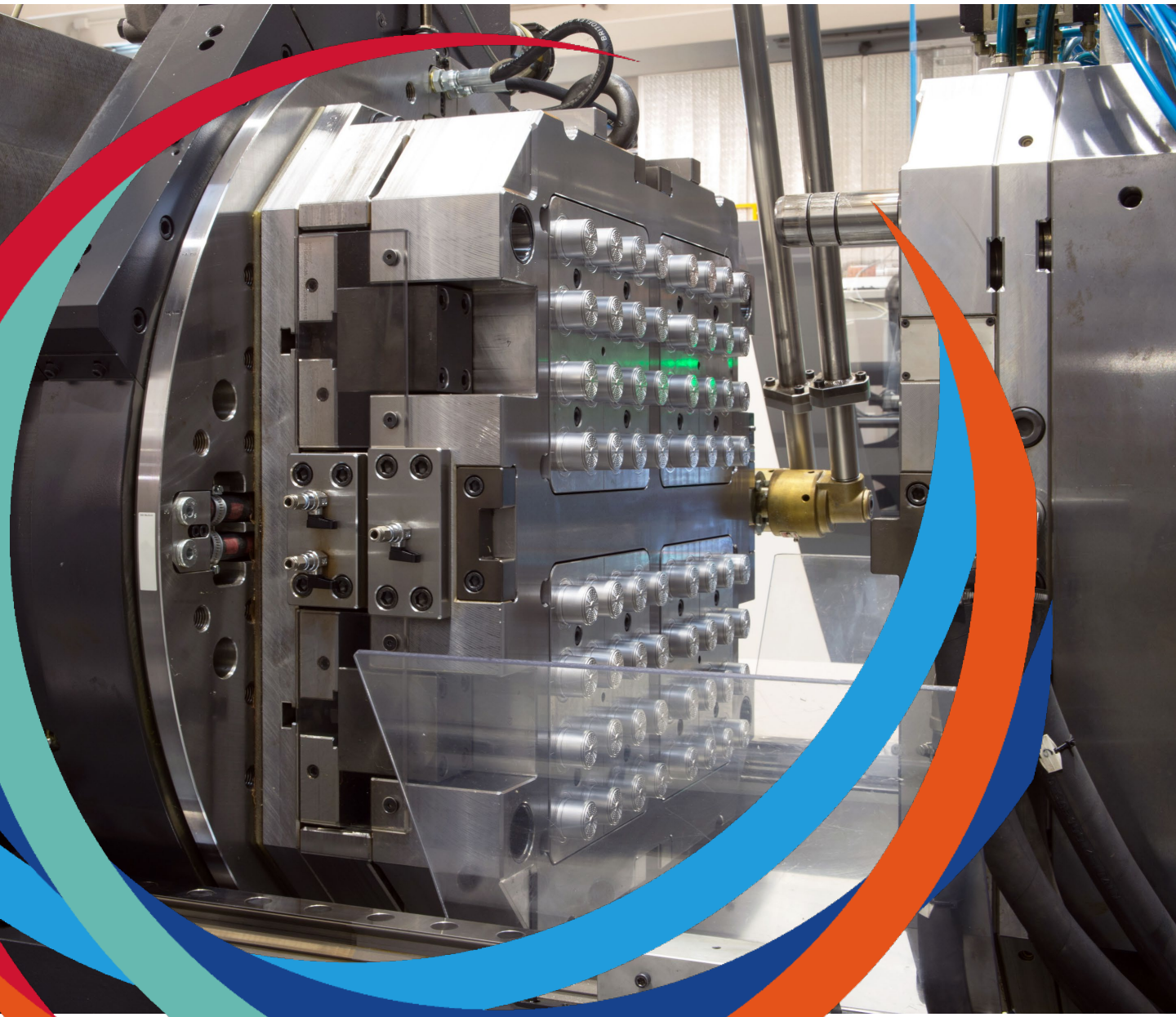
BEYOND
the boundaries of possible

INDUSTRIAL CASE STUDY

HOT RUNNER & INJECTION MOLDING SYSTEMS
COMPOSITE BEARINGS & METAL SEALS



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HYCOMP™ COMPOSITES OMNISEAL® METALS

HOT RUNNER & INJECTION MOLDING SYSTEMS COMPOSITE BUSHINGS & METAL SEALS

Patrick McSweeney October 2024

INDUSTRIAL SELF-LUBRICATION EXTENDED LIFE DRY RUNNING HIGH TEMPERATURE

Environment

In complex industrial equipment such as hot runner systems, precision is a necessity. Hot runner and stack injection mold tools are designed to improve machine efficiency and product output for high quantity parts. Typically composed of sprue bushing, manifold, nozzle and gate components, the equipment also uses mold channels that are maintained at melt temperature. Keeping continuous temperature ensures a mold quality with faster cycle times, better pack out, and reduced waste because the cold sprue is eliminated. Instead, there is a longer sprue connecting the hot runner manifold, which is nested inside a series of stacked plates held together with guide pins. Stacked molds increase potential mold output without increasing machine tonnage.

Challenge

In a hot runner system, the internal tool temperature ranges between 400 to 600°F, which means the assembly components must also operate in this range. If a seal cannot operate at these temperatures, there will be leakage through the seal interface - a critical juncture between the manifold and nozzle. If stacked tool plates are misaligned due to unsupported guide pin movement, leakage will occur in the parting line, ruining part quality and possibly damaging the entire mold. A leak in a hot runner can be detrimental to the functionality of the tool, resulting in clogged nozzles or worse, a clogged manifold. Repairs must be made that will be expensive and time consuming. Imagine weeks of downtime and replacement of valuable components!

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Solution

Hycomp™ composite bearings and Omniseal® metal seals thrive in demanding environments due to their ability to handle high temperatures under extreme pressure. In a stacked mold tool, the sprue bar is longer and needs to be supported by a guide plate. This is a high temperature area that needs to maintain alignment. Many composite materials will deflect under heat and load, but Hycomp™ materials hold their shape. Our Omniseal® metal seals are applied at the interface between the manifold block and nozzle body, which is a critical juncture in the mold flow path. Why use these parts here? The metal seals can be compressed under higher loads due to higher mechanical strength and improved sealing traits of the metal coating.

Along with hot runner technology and the automated injection molding process, composite materials and metal seals deliver long term benefits for many different customers.

- Hycomp™ materials are often used in a variety of mold applications, mostly in stacked mold tools where alignment is key. With zero creep and self-lubricating properties, the material keeps the pin / plate alignment in place for a longer service life and less residual maintenance.
- Our metal seals and composites can be used in many other applications, including injection pin spacers, pivot bushings, and manifold seals.

To Keep Hot Runners Running Efficiently & With Less Cost, Rely On Precision Composites & Metal Seals

Benefits

- Handles higher loads due to high mechanical strength
- Maximizes uptime and minimizes scrap due to proven sealing and leakage control
- Prevents misalignment due to self-lubrication and zero creep

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Design Expertise & Tailor-made Solutions for Your Critical Applications

Omniseal Solutions is a global engineering leader with over 65 years of historical legacy, relentlessly dedicated to the design and manufacture of precision sealing and wear control solutions that protect critical applications in the most demanding environments and passionately driven to push *Beyond the Boundaries of Possible*.

Contact Our Expert

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