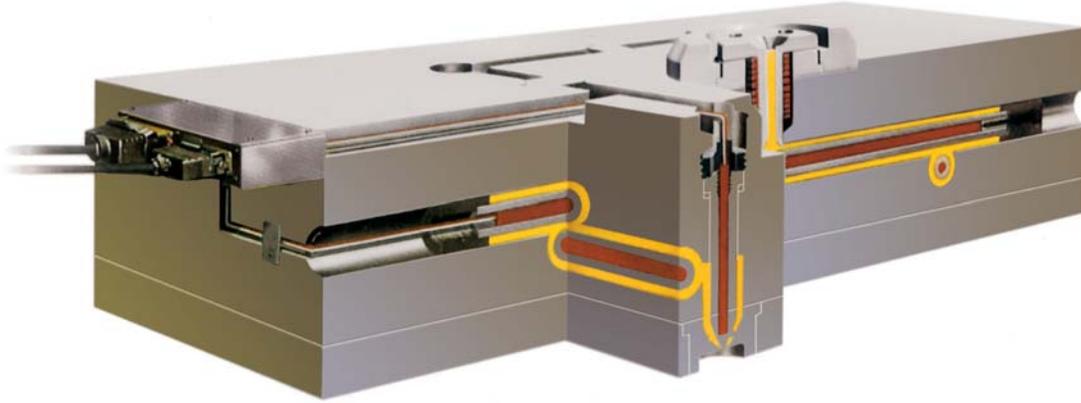


The Cool One – Features and Benefits



Hot runner molds have been in use for decades. Today, energy costs and material availability have become greater processing considerations and new emphasis is being placed on reducing these costs. As a result, a hot runner molding system that can cut energy requirements, shorten cycles, save material and eliminate secondary operations, such as degating parts, spot facing and regrinding runners, is extremely well-suited for the industry.

What is The Cool One?

The Cool One is a group of standardized, pre-engineered components that can be incorporated into a hot runner mold to suit a specific application. The design of the Cool One places particular emphasis on temperature control throughout the system. Standard Cool One components fall into two categories: Distributor System and Probes.

Distributor System

Plastics are injected into the system through the DME Heated Nozzle Locator. The system consists of bores, gun-drilled into the distributor block. A smaller diameter distributor tube is inserted in each bore and centered with end caps.

Material flowing in the bore, around the central tube, is kept molten by a thermocouple-cartridge heater in the tube. Heating the material “from the inside out” is highly efficient, since it allows heater loads to be considerably less than systems which heat from the outside in. In addition, the outer layer of the melt stream solidifies to form an insulating layer of plastics that further reduces energy requirements and permits mold surface temperatures to be maintained at 100° F. In many cases the flow design has a single primary distributor tube with intersecting probes to direct the flow of material to the gates. A primary and secondary distributor tube layout using a common “H” pattern is also a typical method of providing a balanced flow of material to probes intersecting the secondary tubes. (The cutaway view above is an example of the “H” pattern layout.) A wide variety of intersecting layouts are possible to carry molten material to virtually any number or pattern of cavities.

For even smaller molds, or increased cavitation in larger molds, DME has standardized a group of Micro Cool One components applicable for solid block designs. In this design, smaller distributor tubes and cartridge heaters are used in conjunction with smaller “integral heater” gating probes. The Micro Cool One utilizes round distributor channels and a single level of distribution. System designs incorporate the Solid Block concept (as shown in the illustration above).

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Probes

Molten material flows through the distributor system to intersect with the probes centered in the probe bores. The heated probes keep the material molten and flowing to the gates.

In general, the gate is the most critical point in any hot runner mold. A perfect temperature balance has to be maintained at the gate if the mold is to run effectively. The molder has to find the “compromise” temperature which will fill the cavity, provide good part quality, keep the plastics molten and still shut-off without drooling when the mold opens for part ejection. The gate size and cycle time are also major variables that have to be considered in achieving this proper balance.

With the DME system, cartridge heaters in both the tubes and probes contain integral thermocouples. This allows the heaters to be closely monitored and continuously adjusted by closed-loop temperature controls.

DME Auto-Fixed™ probes are offered in three styles – finless with integral heaters, and finned or finless with replaceable heaters. The “integral heater” probes are smaller in diameter than the others, making them ideal for smaller molds or closer cavity patterns. The finned style employs a precision-engineered tip configuration that automatically “fixes” the relationship between the probe tip and gate (i.e., centers the probe and limits tip protrusion into the gate). The finless style provides a wider selection of probe lengths (up to 10”) for larger molds and deeper cavity configurations. An optional register ring is available for these probes to provide added stability at the probe tip if desired. Probes of different lengths can be used in the same mold to suit the gating requirements and contours of the molded part.

To save the moldmaker valuable machining time, standardized gate inserts are also available for all probes. Made from prehardened AISI S-7 steel, these inserts are pre-machined with the appropriate internal configurations for optimum probe performance.

Benefits

For The Processor

Some of the most readily apparent benefits of The Cool One are to the plastics processor. Basically, the system offers more quality parts while reducing labor and material costs.

As proven in actual production, this DME Hot Runner System can:

- **Increase Production ...** Faster startups, faster cycles and delay-free automatic operation
- **Conserve Energy ...** “The Cool One” uses up to 75% less energy than conventional hot manifold systems and no regrind operations are necessary
- **Conserve Materials ...** No sprues or runners and fewer rejects make 50%–80% material savings possible
- **Improve Part Quality ...** Improved temperature control provides better gate cosmetics, more homogeneous melt
- **Increase Uptime ...** Contamination can be cleared or cartridge heaters replaced quickly with the mold in the press

For The Designer

Standardized components have established themselves as the best, fastest and least expensive way to design tools. This is especially true with DME pre-engineered hot runner molding components.

- **Maximum Design Flexibility ...** Improved cosmetics offer wide choice of gate locations; Distributor System configurations are virtually unlimited
- **Production Proven ...** Predictable performance based on decades of successful applications.

For The Moldmaker

- **Shorter Lead Times ...** Pre-engineered components allow the moldmaker to go from part print to part approval (and final payment) sooner
- **Availability ...** Components are available from stock for immediate delivery which means faster mold construction and more uptime