



iControl™

HOT RUNNER INSULATION

A BREAKTHROUGH IN INJECTION MOULDING

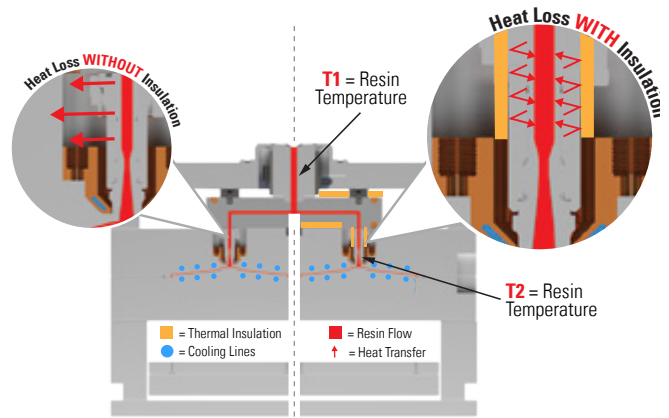
THERMAL MANAGEMENT

DME iControl™ HOT RUNNER INSULATION

PROVIDING BREAKTHROUGH MOULDING PERFORMANCE WHEN USED WITH HOT RUNNER SYSTEMS

The unique nano microporous material of iControl improves the insulation of the hot runner system by reducing the thermal variation of the mould. Easily installed at time of original build or later as a retrofit, iControl will greatly reduce the thermal variation throughout the manifold and nozzles so the temperature of the incoming resin (T1), closely matches the temperature at entry to the cavity (T2). Balancing the temperature across the system opens the possibility to lower both melt and mould temperatures.

Result: Less heat in means less heat out for accelerated startups and faster cycle time.

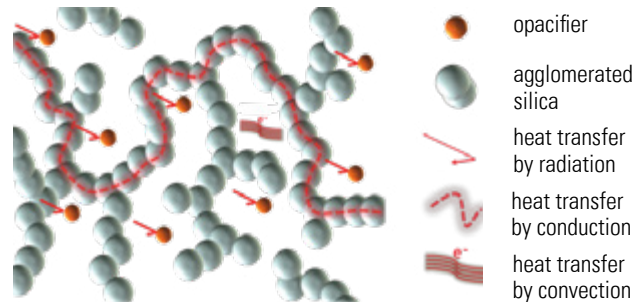


Benefits of lower melt temperature:

- Reduced cycle times
- Faster start up times
- Reduced energy consumption
- Processing of heat sensitive materials such as optical grade resins, bioplastics and resins with high post-consumer recycle content which are all prone to degradation with elevated processing temperatures and a more homogenous melt assuring better part quality

Hot Runner Insulation - Minimizing Thermal Variation

Today's hot runner systems rely on the use of an air gap to minimize the thermal transfer between the plates. However, air is a less effective insulator at elevated temperatures and, as a result of the difference in the temperature between the hot and cold plates, heat is transferred and the mould's cooling process is negatively impacted. iControl Insulation can alleviate this problem due to its superior insulation properties, especially at elevated processing temperatures.



The extremely low thermal conductivity of iControl is a result of its microporous structure and the addition of opacifiers. iControl material insulates against all three components of heat transmission: conduction, convection and radiation. Low conduction is a result of the very small silica particle agglomerates of approximately 10nm which only have a single point to touch each other. Convection heat transfer is minimized by the unique nature of the micro pores which prevent the movement of air and hence the transfer of heat. Finally, the inclusion of opacifiers minimize heat transfer due to infrared radiation.

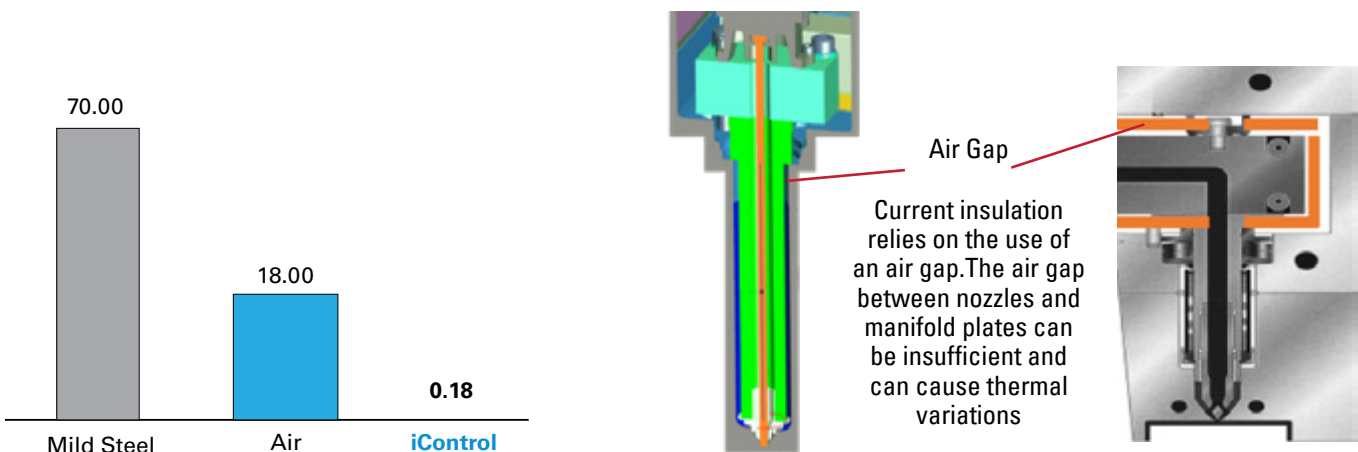


Image on the cover shows iControl insulation installed on an Incoe® Hot Runner System. DME is not affiliated with Incoe Corporation

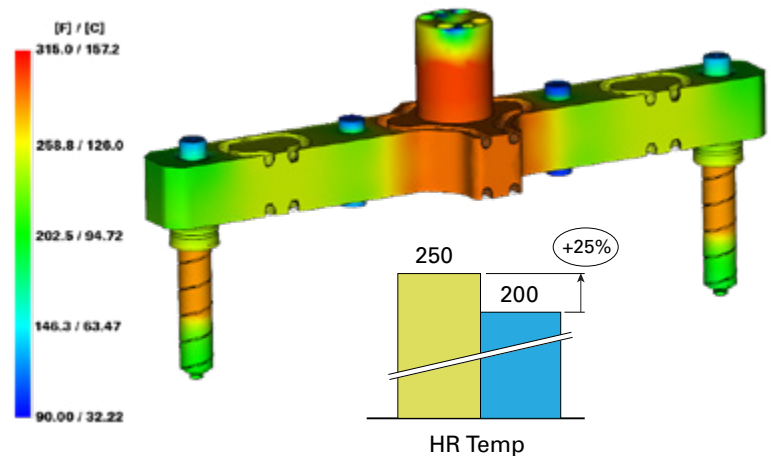
Cycle Time Advantages & Lower Energy Requirements

Without iControl

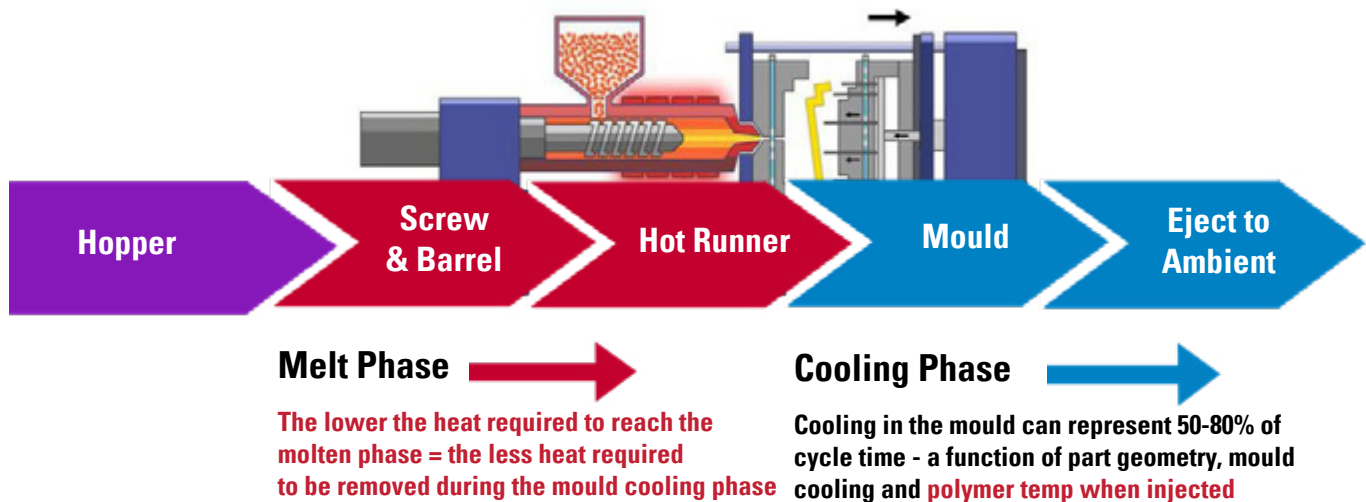
- Longer cycle times
- Part quality issues
- Polymer degradation
- Higher Energy Use on Heating and Cooling
- Double digit thermal variation in Hot Runner Systems (Not accounted for in mouldflow simulation) - Red to Blue areas in manifold
- Often requires higher melt temperature to compensate for the lowest temperature profile

Hot Runner Thermal Analysis Temperature Variance

- Blue areas are in direct contact with the mould
- Green areas are the cold section relevant to the process which drives the temperature setting
- Yellow areas are now "hot" relative to ideal for the material



Balancing the variation in temperature allows for less energy in = less energy out.



iControl Hot Runner Insulation is custom made to your manifold's specifications.
 To request a quote please email 2D CAD of your manifold to DME's Mechanical Engineering Department:
dme_mech_eng@dme.net

DME THERMAL MANAGEMENT

Our approach to the moulding process is a scientific one. By understanding the type of resin and necessary flow requirements we can help you to optimize and control the thermal management of the manifold and nozzles. When combined with efficient cooling, the production output of high-quality parts can be maximized.



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