How and where heat pipes work
The DME Heat Pipe is a heat transfer device specifically designed for optimal performance in plastic injection molds. It consists of a vacuum-tight copper tube containing a wick and a non-toxic working fluid. One end of the heat pipe is an evaporator, the opposite end is a condenser. Thermal energy is gathered at the evaporator end, vaporizing the working fluid. This vapor then travels through the Heat Pipe to the condenser end. At the condenser end the vapor condensates back into a liquid, giving up its latent heat in the process. To complete the cycle the condensed liquid then travels along the wick, via capillary action, back to the evaporator section. This process repeats itself continuously, transferring heat many times faster than pure copper.

How heat pipes are used
Available in a variety of standard lengths and diameters, DME Heat Pipes are used in cores, core slides, cavities and other areas of a mold or die requiring cooling or controlled temperatures. Commonly used in place of bubblers, baffles, fountains or blades, Heat Pipes transfer heat rapidly to the coolant, rather than requiring the coolant to flow into the heated area. They are also used to transfer heat to a cooler portion of the mold (which serves as a heat sink) or to open air, thereby permitting cooling of otherwise inaccessible areas and eliminating potential coolant leakage.

Standard injection molding heat pipes
The standard line of Heat Pipes for injection molding includes both a low-temperature (TPL) and a high-temperature (TPH) series. The TPL Series works most efficiently between the temperatures of 40° and 200°F with a coolant temperature of approximately 60° to 80°F, and the TPH Series between 150° and 400°F with a coolant temperature of approximately 90° to 110°F. The sealed end of each heat conductor is color-coded (BLACK for the TPL series and WHITE for the TPH Series). Selection of the appropriate series is based on the application’s melt, mold surface and coolant temperatures to which the Heat Pipe will be subjected.

Benefits of heat pipes
Cool Molds Faster and Reduce Cycle Time
The Heat Pipe’s ability to cool molds faster and thus reduce cycle time is due to a number of factors. First, waterlines throughout the entire mold can be larger in diameter, permitting a higher coolant velocity, which transfers heat faster. Second, the larger volume of fluid flowing through the waterline results in a lower overall coolant temperature rise, so that the last Heat Pipe in the system will transfer heat as efficiently as the first. Third, the extension of the Heat Pipe into the waterline promotes turbulent flow, which transfers heat faster than laminar flow. Fourth, the ability to transfer heat away from inaccessible areas improves the overall cooling rate and reduces cycle time, even if extension into a remote waterline is impractical or impossible.

Improve Part Quality
As the Heat Pipe transfers heat to the coolant, air or mold component, it also dissipates heat evenly along its entire length. This isothermal action provides faster and more uniform cooling, thus eliminating hot spots, which cause sink marks, pulling and spotting.

Simplify Mold Design and Lower Costs
With Heat Pipes, waterline design is greatly simplified since coolant flow into the heated area of the mold is not required. In addition, the ability to locate heat conductors in areas inaccessible to other cooling devices can further simplify the overall mold design. In most cases, the machining and construction time required for the mold is reduced, lowering moldmaking costs.
MOLD COOLING
Heat Pipes - Cooling Pins

Reduce Maintenance and Operating Costs
The increased waterline diameter, coolant velocity and heat capacity effectively eliminate scale formation, calcium deposits and the plugging up of small waterlines and ports. In addition, Heat Pipes operate in any coolant without corroding.

Upgrade Existing Molds and Dies
Heat Pipes effectively solve cooling, cycle time or part quality problems in existing molds. They can be retrofitted as replacements for bubblers or baffles and to provide heat transfer in previously uncooled areas.

Salvage Damaged Molds and Dies
In certain applications, Heat Pipes can even be used to salvage or repair molds that would otherwise have to be scrapped or extensively reworked.

Selecting the right size and shape
The standard diameters and lengths of TPL and TPH Series Heat Pipes will satisfy most applications.

<table>
<thead>
<tr>
<th>ITEM NUMBER</th>
<th>TARS-04</th>
<th>TARS-06</th>
<th>TARS-08</th>
<th>TARS-10</th>
<th>TARS-12</th>
<th>TARS-16</th>
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<tbody>
<tr>
<td>Ring I.D.</td>
<td>1⁄8</td>
<td>9⁄32</td>
<td>5⁄32</td>
<td>1⁄4</td>
<td>9⁄32</td>
<td>5⁄32</td>
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</table>

QUANTITY DISCOUNTS:
Discounts for all Heat Pipe sizes and series apply to current net prices.
8 to 20............ Less 5%
21 to 35............ Less 10%
36 to 60............ Less 15%
71 or more.... Quoted by request

TPL and TPH heat pipes for injection molding
For low-temperature Heat Pipes (40°-200°F) use TPL (color-coded BLACK) as a prefix in front of item number in the chart below. For high-temperature Heat Pipes (150°-400°F) use TPH (color-coded WHITE) as the prefix. Examples: TPL8600; TPH6500.

<table>
<thead>
<tr>
<th>LENGTH (INCHES)</th>
<th>TPL &amp; TPH DIAMETER &amp; ITEM NUMBER</th>
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</thead>
<tbody>
<tr>
<td>3</td>
<td>4300 6300 8300</td>
</tr>
<tr>
<td>4</td>
<td>4400 6400 8400</td>
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<td>5</td>
<td>4500 6500</td>
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<td>4600 6600</td>
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<td>4800 6800</td>
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<td>10</td>
<td>101000 121000 161000</td>
</tr>
<tr>
<td>12</td>
<td>161200</td>
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Silver heat transfer compound* – HTC06S
Contains micronic particles of silver to provide a thermal resistance of 4.75°C in/watt. The compound is supplied in a 5cc plastic syringe. (DME recommends the Silver Heat Transfer Compound because it has eight times lower thermal resistance than the copper equivalent.)

Copper heat transfer compound* – HTC30C
Contains micronic particles of copper to provide a thermal resistance of 38°C in/watt. The compound is supplied in a 5cc plastic syringe.

QUANTITY DISCOUNTS:
(Heat Transfer Compounds) Discounts apply to current net prices.
2 to 5.................Less 5%
6 to 9...................Less 10%
10 or more............Less 15%
Quantities of silver and copper compound may be combined for discounts.

Tamp ring sets – TARS
Each set includes 32 silver alloy tamp rings (enough for installing 16 Heat Pipes) and one hollow tamping tube. Select the required tamp ring set by its I.D. to match the O.D. of the Heat Pipe being used.

QUANTITY DISCOUNTS:
Discounts for all Heat Pipe sizes and series apply to current net prices.
8 to 20............ Less 5%
21 to 35............ Less 10%
36 to 60............ Less 15%
71 or more.... Quoted by request

NOTE: Heat Pipes cannot be used as ejector pins and parts cannot be molded or cast against them. Also, Heat Pipes cannot be cut, machined, bent or plated. If a special size is required, contact DME to discuss your application.