BRUSHWELLMAN
ENGINEERED MATERIALS

BRUSH UPS

KEEPING YOU UP TO DATE ON MOLD ALLOYS

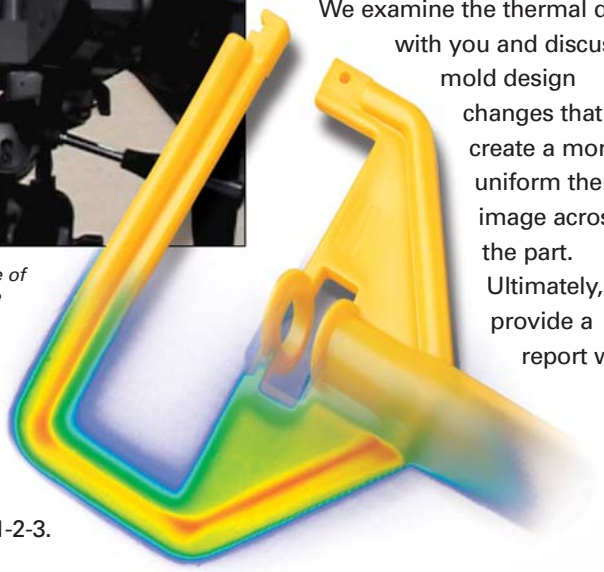
MOLDMAX® MOLD ALLOYS

NOV./DEC. 2004

A Picture is Worth a Thousand Words

For more than 20 years, Brush Wellman has been committed to bringing high thermal conductivity and uniform cooling to the plastics market. Today, as part of our service we bring Infrared Imaging Technology to you. With our sophisticated IR cameras and knowledgeable staff we can literally look inside your mold and show you, in real time, how and where the thermal management properties of our MoldMAX® mold alloy can make a difference in your part and your molding operations. It's as easy as 1-2-3.

IR imaging captures a true picture of your mold's thermal performance



Step-by-Step Process

Step 1

We sit down with you and review the principles of thermal management of molds, discussing the benefits of applying them to the mold design. At this point, we also determine which molds would benefit most from IR thermography.

Step 2

We photograph parts as they come out of the mold, right at the end of the production line. This captures a true picture of your mold's thermal performance. Once we download the images, we review them with you on the spot.

Step 3

We examine the thermal data with you and discuss mold design changes that will create a more uniform thermal image across the part. Ultimately, we provide a report with recommendations for you, both on hard copy and CD. Following our suggestions will reduce your cycle times, achieve more uniform cooling, and dramatically lower scrap rates.

continued on page 2

Using Infrared Technology to Improve Mold Design Presented at MoldMaking 2004 Expo

Brush Wellman's Scott Monteith and Dr. Bob Kusner co-presented "Using Infrared Technology to Improve Mold Design" at the MoldMaking 2004 Expo, held in Cleveland, OH, June 22-24.

Scott Monteith

The seminar, which ranked among the top eight out of 36 presentations, outlined how the use of infrared technology can improve mold design, resulting in improved margins and lower costs. In addition to learning how to use an IR camera to gather mold performance data, seminar attendees also discovered the four control dials of thermal management—core/cavity material; water line design; temperature delta; and managing the cooling fluid rate. Lastly, attendees learned how to use the mold performance data gathered through IR imaging to adjust these three dials, ultimately improving mold design and performance.

A copy of the presentation is available by visiting **www.MoldMAX.com/IRimage-ABU** or by calling us toll-free at **888-MoldMAX** (888-665-3629).

continued from page 1

Once you have seen this process at work, we're sure you'll agree that managing the thermal properties of your mold is the least expensive way to reduce costs.

Case in Point

Weatherchem Corporation, a plastic closure manufacturer, achieved a 41% cycle time reduction during injection molding of an in-ground sprinkler system control knob by modifying the existing tool steel mold with a MoldMAX® sleeve section and a PROtherm® central bubbler. This reduced the cycle time from 37 seconds to 22 seconds. Replacement of the sleeve section with MoldMAX HH® (high hardness) increased the efficiency of heat removal from the plastic part. A water channel was eliminated from the sleeve section based on the higher thermal conductivity of MoldMAX. To eliminate concentration of heat in the sleeve section, PROtherm was selected to replace the central bubbler.

Collins & Aikman, formerly Textron Automotive Company, has also taken advantage of Brush Wellman's IR Imaging analysis. Previous tools had high temperatures in the central core, which had deep, intricate rib patterns making uniform cooling problematic. A new mold was designed to have a MoldMAX XL® core. MoldMAX XL allowed heat to be removed faster creating a uniform cool pattern. Due to having substantially more conductivity than P-20, the mold is now running 28% faster using MoldMAX XL. Before MoldMAX, the tool steel had many hot spots and a sporadic heat pattern that caused lengthy cycle times and part distortion. Payback on this investment was less than one month, and the savings generated by the use of MoldMAX XL will exceed $1,000,000 over the life of the tool.

For more information on IR Imaging, visit our web site at **www.MoldMAX.com/IRimage-ABU** or by calling us toll-free at **888-MoldMAX** (888-665-3629).

MEET YOUR BRUSH WELLMAN PLASTICS TEAM MEMBER

Profiled: Dr. Robert Kusner

Robert E. Kusner

Robert E. Kusner, Market Application Development Engineer for Brush Wellman's Alloy Products group, has responsibility for new product development, fabrication of custom engineered components from Brush Wellman materials and supporting the technical service group.

Dr. Kusner joined Brush Wellman in 2000. His experience prior to Brush Wellman included being a principal owner in a business that designed and built automated vacuum deposition systems.

Dr. Kusner graduated from Case Western Reserve University with a Ph.D. in condensed matter physics. His areas of expertise include metallurgy, phase transitions, computer modeling of physical systems, and vacuum, thin film coating technologies.

Most recently, Dr. Kusner co-presented "Using Infrared Technology to Improve Mold Design" at the MoldMaking 2004 Expo, held in Cleveland, OH, June 22-24.

About Brush Wellman's Mold Alloys

Brush Wellman (NYSE:BW), a subsidiary of Brush Engineered Materials Inc., is the world's leading supplier of high performance alloys, providing high reliability copper beryllium and spinodal alloy products with unparalleled global service.

Brush Wellman's mold alloys, the proven leaders in developing and growing the use of high strength – high conductivity copper alloys for molds used in the plastics industry, are supported worldwide through a network of Ph.D. metallurgists and experienced application engineers.

The value added characteristics of Brush Wellman's mold alloys have successfully reduced part costs substantially and produced more efficient manufacturing processes for our customers. On average, the cost differential of tool steel to MoldMAX® is recovered in cost reductions within the first three months of production, making Brush Wellman mold alloys the least expensive path to substantial cost reduction offered in the industry today. All of this allows you to be more competitive in a world economy. To learn more about Brush Wellman's mold alloys visit us at **www.MoldMAX.com** or call **1-888-MoldMAX** (1-888-665-3629).

"Brush Ups" on Mold Alloys is a new publication developed to keep you informed of advancements and trends not only in the plastics industry, but also within Brush Wellman's plastics segment of the Alloy Products group. Look for Brush Ups on a bi-monthly basis. In our next issue, we'll Brush Up on using thermal management solutions to drastically reduce part costs.

MoldMAX®- Mold Alloys

Providing Thermal Management Solutions

BRUSHWELLMAN
ENGINEERED MATERIALS
17876 St. Clair Avenue, Cleveland, Ohio 44110 U.S.A.
www.MoldMAX.com • 888-MoldMAX