

For Release: NPE 2006 -- June 19, 2006 (BRO-8010 -- Final)

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Brown Machine LLC, NPE 2006 News (Booth #S1409):

Brown Machine Delivers High Speed Cut Sheet Appliance Thermoforming System

Beaverton, MI – Brown Machine LLC announces an advanced four station pressurized rotary for high speed processing of refrigerator door and cabinet liners. Approached by a globally-leading appliance manufacturer, the challenge was to produce liners at unmatched speeds on rotary equipment that offers ease of operation, setup and maintenance to the end user. This customer has traditionally utilized in-line cut sheet equipment for the past several years and chose to return to the rotary thermoforming method for a new facility. Through a series of specification discussions, requirements were developed and engineered; followed by the manufacture of multiple machines and turn key installation. These lines are producing door and cabinet liners at unprecedented cycle rates.

The design of this equipment is based on Brown Machine's ultimate pressure R-Series rotary thermoformers, viewed by the industry as the most controllable, precise, repeatable, durable, dependable and maintainable heavy-duty machines on the market. Specific considerations to structural elements for static support; coupled with support, flex, movement and expansion during the pressure function are crucial to the design. These considerations are all satisfied without sacrificing speed, precision and process. Furthermore, this all has to be accomplished for assembly / disassembly, transportation and rigging processes.

Jointly working together, both the customer and Brown Process Engineers optimized all areas of the machine to eliminate dead time and maximize the overall cycle. High speed platens with closed loop VFD control to provide upper and lower platen repeatability within +/- .005", increased speed of the gear rotate system, multiple zone high level watt density pre-heat and final heat ovens, zone control through heater control modules, numerous water circuits, and high capacity pneumatic valve circuitry, coupled with new flange cooling methodology and high pressure forming resulted in the success of this equipment. The various machine segments were then tied together and controlled through Brown's easy to operate open architecture non-proprietary hardware and software control system.



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An additional requirement was the achievement of a thirty minute product-to-product changeover time. The use of a mold pre-heat station, tool locators, automatic utility connections as well as design enhancements within the equipment facilitated this objective.

Further to the achievement of the exceptional production rates is the integration with the suppliers of the molds, as wells as the auxiliary equipment as temperature control units, chillers and vacuum pumps.

Single Station and Rotary Solutions

Brown provides a comprehensive line up of shuttle and rotary equipment. Single station machines feature advanced thermoforming technology, and with a full range of options the customer can configure a machine to suit their specific needs. High end single station machines with pressure capabilities are also available. Rotary equipment is available in entry level three and four station vacuum models, again with numerous available options, to high pressure machines with twin sheet capabilities, and to our ultimate pressure/twin sheet machines whose performance is unparalleled in the industry.

Brown Machine at NPE 2006

Brown Machine will be exhibiting at NPE 2006 at McCormick Place in Chicago, IL, June 19-23, 2006 at booth #S1409 and can answer your questions regarding rotary and shuttle cut sheet thermoforming solutions that meet your requirements.

On Brown Machine LLC

As a global leader of thermoforming technologies, Brown Machine LLC engineers and builds a complete standard line of continuous and cut-sheet thermoforming equipment and related tooling/peripheral equipment. Specialty thermoforming systems suited to a wide range of markets (including automotive, recreational, packaging, appliance and various other industrial segments) can be custom built to exact customer specifications. Brown Machine fully supports the thermoforming industry (Brown machine owners and



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competitive models, as well) with a full complement of 24/7/365 on-call service and parts support.

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