# innovation

taking shape

## Accumulator head technology industrial blow molding machines

GRAHAM ENGINEERING CORPORATION

# accumulator head technology

## GRAHAM ACCUMULATOR HEAD BLOW MOLDING SYSTEMS

In 1997, Graham Engineering invented and patented the closed loop servo press. In 2002, the company developed the first industrial machine with PC controls.

Graham accumulator head machinery represents the culmination of over 50 years of technological innovation for producing high quality, small to large-scale blow molded parts.

Accumulator head technology from Graham Engineering spans a wide range of shot capacities. It delivers the quality, speed, flexibility, and reliability required for maximizing production line output. Graham equipment conforms to all national and international safety and operating standards with ANSI certification and CE capability.

Graham's accumulator head blow molding systems are designed for the production of a wide range of industrial and technical parts including:

- Automotive spoilers, duct work and reservoirs
- Coolers/chests
- Swing sets, slides, bicycles
- Medical parts
- Housewares
- Trash cans
- Ornamental packaging
- Water coolers and filtration containers
- Industrial containers
- Panels
- Double wall parts
- In-mold carpet, vinyl and component insertion

## KEY SUB-SYSTEMS OF GRAHAM ACCUMULATOR HEAD MACHINES

There are many highlights to Graham's accumulator head blow molding technology. Here are key benefits of the critical subsystems and the overall machine:

**Accumulator Head**

- Rapid color/material changes
- Balanced flow distribution within the head optimizes seamless material reknit
- Fast material and color changes are accomplished by our self-cleaning plunger and proven spiral diverter flow paths
- Uniform flow design eliminates stagnant areas
- Purges most colors/ materials within 1/2 to 3/4 hour; even the most difficult changes (black cherry to yellow) can be 1-1/2 hours
- Disassembly/cleaning/ reassembly in less than 1 hour; only requires simple hand tools
- Resins processed: PC, Noryl, ABS, PP (standard, glass, and talc filled), 10 and 4.5 HLMIPE, high impact PP, acrylic, LDPE, PU, PS, HDPE (standard, glass, and talc filled), and nylon (glass filled)
- Bleed off valve on top of head away from heater bands
- Unique tooling distribution ring straightens parison curl, maintains head vertical centerline, and eliminates misalignment
- Extruded aluminum heaters with cal rod elements for long life; eliminates shorts and prevents ground outs
- 28:1 L/D extruders
- Grooved feed throat delivers high output and lower melt temperature

**Clamp Section**

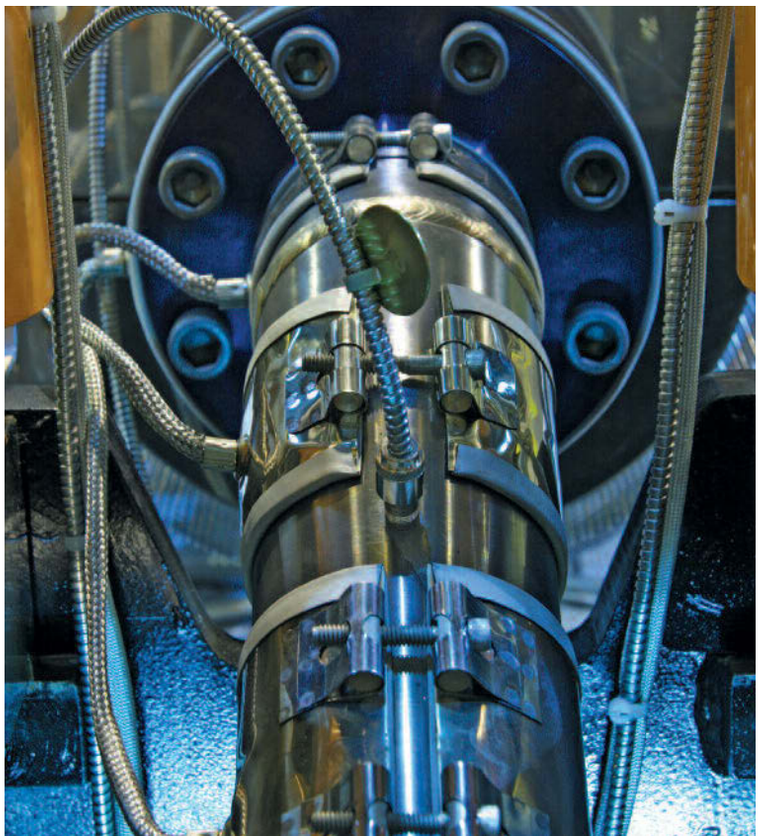
- Motorized vertical adjustment (up/down jog switch) is standard
- Motorized press roll out is standard
- Servo-actuated press features independent platen motion with speeds for all open/close positions; extremely accurate with no mechanical backlash; eliminates rack and pinion mechanism; pre-set mold centerline (can be offset)
- Lock-up of platens with no push over on close center-line; eliminates damage to blow pins by keeping uniform opening
- Clamp tonnage is easily adjustable via XBM Navigator screen and proportional valve
- Highly consistent cycle-to-cycle platen position with programmed function to control ramping
- Clamp tonnage via proportional valve

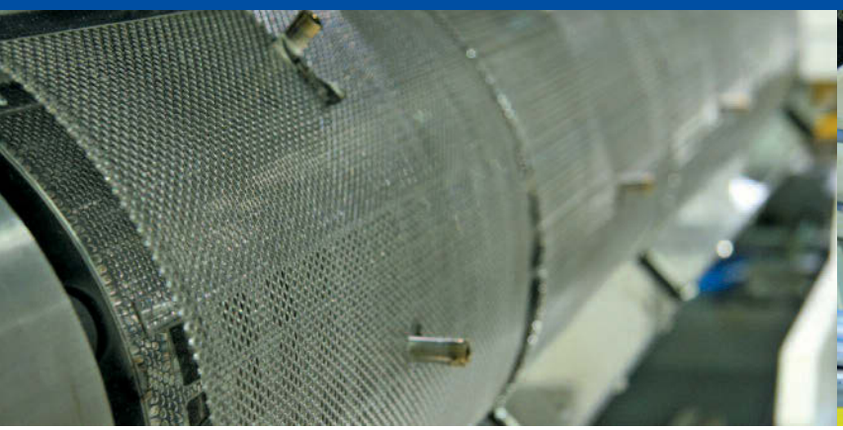
**Regenerative System — Clamp Fast Close/Open/Tonnage Cylinders**

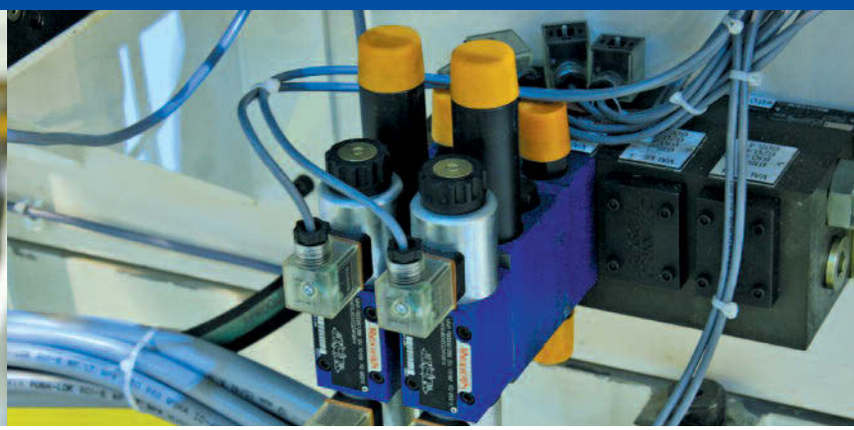
- Saves energy
- Smaller hydraulic lines, smaller AC motors, smaller tank capacity

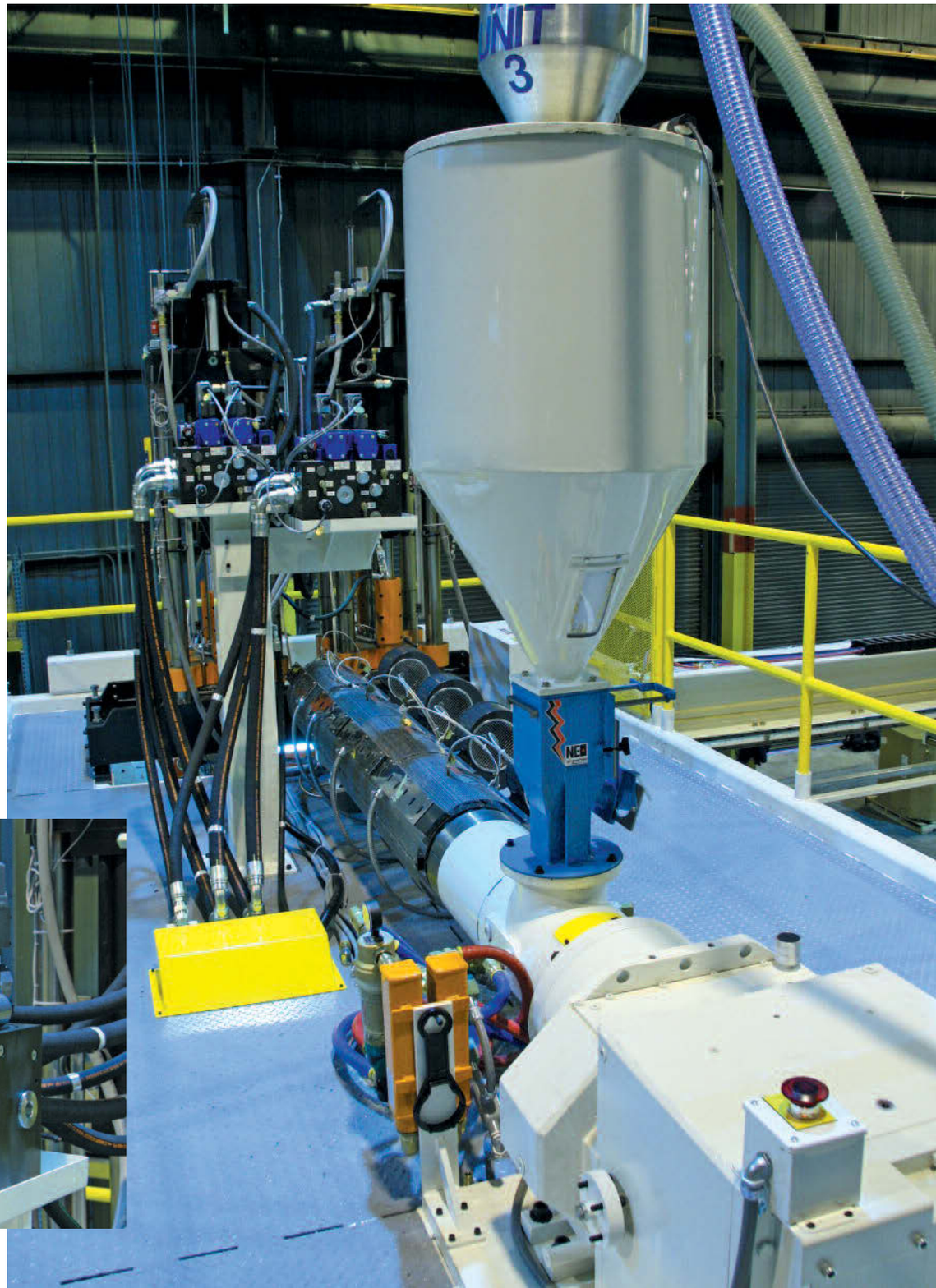
**Multi-Head Industrial Machines**

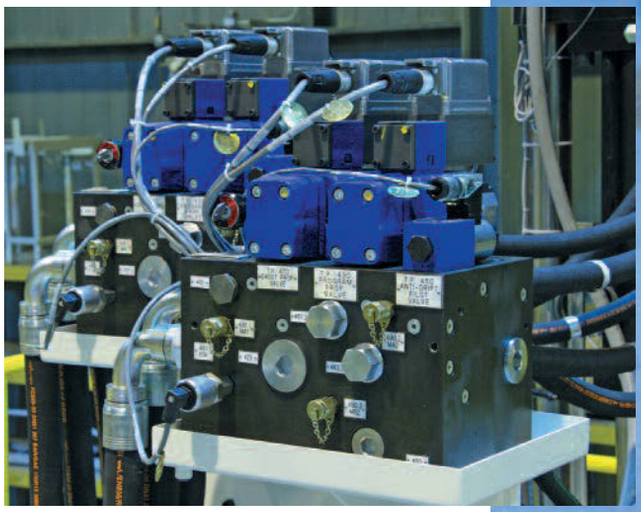
- Melt accumulates in a separate, first-in/first-out shot pot
- Proportionally controlled hydraulic cylinder feeds resin to individually programmable extrusion heads
- Balanced flow passages ensure equal flow between each head
- Motorized vertical platen and press rollout
- Patented closed-loop servo control system
- High production outputs in a single machine footprint

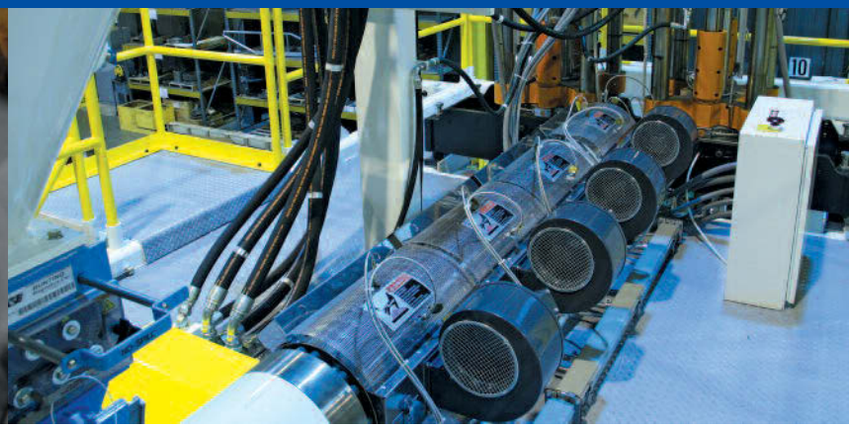







UNIT
3



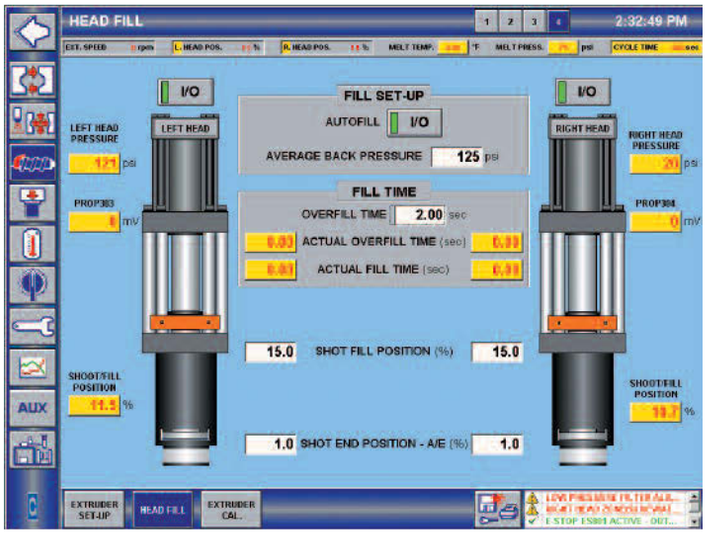



## XBM NAVIGATOR™: PC-BASED CONTROLS DEVELOPED BY BLOW MOLDERS FOR BLOW MOLDERS

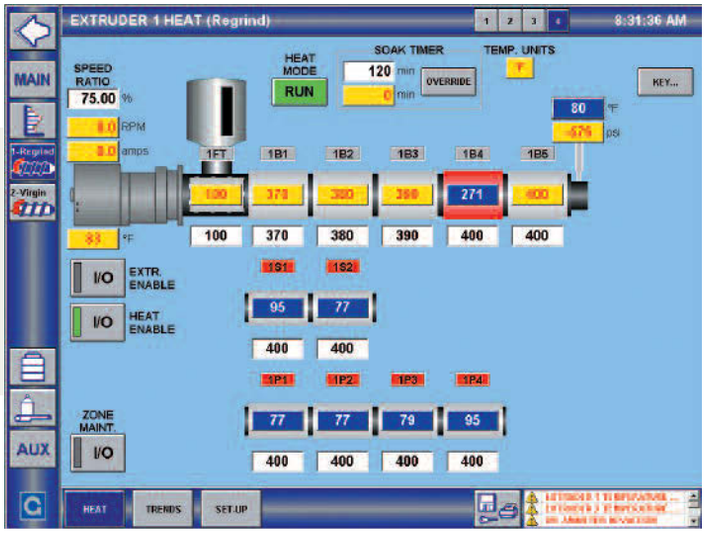
The efficiency of a production line is closely linked to the accuracy and ease of use of its controls. That is why every Graham blow molding machine uses the XBM Navigator™, a proprietary PC-based system designed by us. The hardware is a standard, 24-volt industrial PC, which eliminates any need for manufacturer-specific components or system expertise. The man-machine interface is a flat panel color display with touch screen capabilities. But the real beauty of the system lies in its Windows® platform operator interface software — it is a package developed by Graham, whose years of blow molding experience ensure that set-ups, trending, analysis, and troubleshooting functions will all be intuitive to the operator.

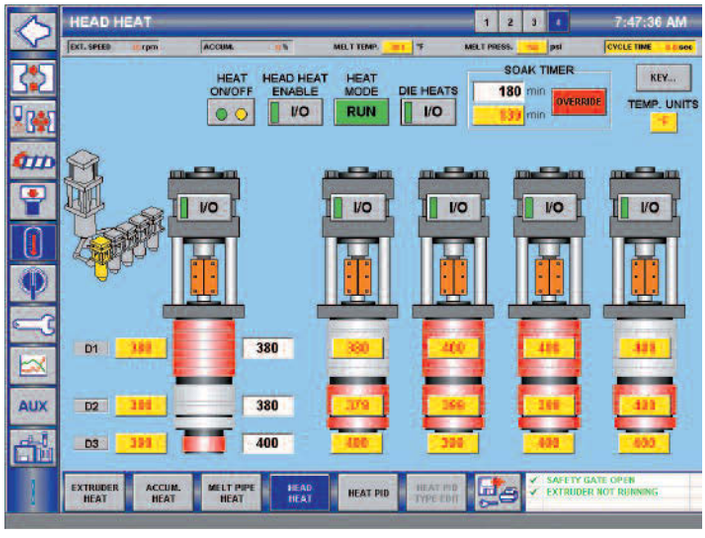
- All machine control parameters and process variables are easy to call up, check, and adjust
- 100-point parison programming
- Remote diagnostics via Ethernet connection — enables fast, easy troubleshooting by Graham's technical support team
- Swing arm mounted operator station (optional) allows for improved line-of-sight setup and operation

- Graham's equipment manuals represent a valuable added resource for customers. They are available in paper and electronic formats. They can be accessed from the machine's PC as clickable PDFs offering helpful photos, schematics, and parts lists.




**XBM Navigator,™ winner of Control Design's 2008 Innovator Award**




**Graham's XBM Navigator™ PC controls utilize intuitive, graphical screens, allowing operators to come up-to-speed quickly. The graphical approach aids in setup and troubleshooting; for example, the color of the heater bands changes to red when heat is applied, and to blue when cooling is applied. Multiple access levels allow different levels of control for operators, technicians, and maintenance personnel. The screens can be switched between dual languages with the touch of a button. Other features include remote diagnostics, trending of key variables, and complete logging of process changes.**

GRAHAM ENGINEERING CORPORATION

Graham Engineering Corporation • 1203 Eden Road, York, PA 17402-0673 • USA
Tel: 717-848-3755 • Fax: 717-846-1931 • www.grahamengineering.com • sales@grahamengineering.com