innovation

taking shape

Rotary wheel technology
blow molding machines

GRAHAM ENGINEERING CORPORATION
GRAHAM ROTARY WHEEL BLOW MOLDING SYSTEMS

Worldwide, only one name is synonymous with the mass production of superior quality plastic bottles on rotary extrusion blow molding machinery. That name is Graham Engineering Corporation.

Our rotary wheel blow molding equipment is the result of advanced technology developed and refined on hundreds of wheel systems installed since 1968 on four continents. Graham rotary machines process virtually any thermoplastic.

Graham wheel machines offer maximum flexibility for the delivery of ideal packaging solutions.

- Single and multi-cavity molds
- Monolayer structures and coextrusion up to seven layers
- In-mold labeling
- View stripe
- Aseptic blow molding
- Systems for bottles as small as 60-110 ml
- Systems for bottles as large as 30 liters
- Turnkey engineering and installation
- Other key advantages include bottle lightweighting, unsurpassed energy efficiency, and labor savings.

The MINI™ Wheel is Graham’s latest breakthrough. It is intended for mid-sized blow molders and emerging markets. It is small enough to ship in a standard freight container, but can produce coextruded plastic containers (up to seven layers) of exceptional repeatable quality.

Our equipment conforms to all national and international safety and operating standards with ANSI certification and CE capability.

Our sales and service professionals work closely with customers to identify and install optimal production machinery solutions and to provide responsive 24-hour support for reliable, consistent production line performance.
Graham Engineering's wheel systems are used extensively for the production of HDPE and PP extrusion blow molded containers. Their high output capability established them as the technology of choice for producing motor oil bottles, household and industrial chemical containers, and many other high volume packages. Graham wheels are also popular for the production of juice and dairy based bottles. Graham wheels are configured to produce both conventional and aseptic dairy packages.

**KEY ADVANTAGES**

- Graham's proprietary parison programming requires only a small, simple hydraulic system
- High repeatability of the blowing process
- Ability to run two different bottles on one wheel system in some cases
- Lowest possible bottle costs when properly applied
- High speed production up to 8.5 RPM (7 second cycle time)
- Neck-to-neck molding capability
- Patented positive bottle takeout
- Wheel machines provide the most accurate multilayer system technology requiring only one or two parisons
- Wheel Processing Consistency
  - 100% controlled parison, held at both ends, with tolerances reduced to an absolute minimum and target layer thicknesses easily reduced
  - Graham is experienced at engineering for high speed melt flows and very fast reaction times of parison wall thickness control
  - Melt pumps may optimize flow consistency

**Flowhead Technology**

- All Graham rotary machines are available with multilayer production capabilities, up to seven layers of material distribution
- Graham multilayer coextrusion systems facilitate use of in-process or post-consumer recycled materials
- Graham's patented remote die adjuster allows operator to fine-tune flow head for precise sidewall distribution, operating without tools and while wheel is running

**Wheel IML**

- Labeling usually occurs with no loss in cycle time and with precise, consistent placement accuracy
- Runs up to 60-65 strokes per minute
- Dual placement units position labels in two cavities at a time and doubles placement rate
Conveying, Trimming, and Reaming

- Graham rotary machines require no reorienting — bottles exit machine uniformly on a single conveyor.
- Variety of in-house and third-party trimmer equipment can be integrated by Graham on our manufacturing floor.

Wheel Models for Every Capacity Requirement

- MINI Wheel (12 molds) — for emerging markets, smaller production requirements and ideally suited for coex applications.
- Compact (9/12 molds) — for general duty smaller size food applications.
- Regular wheels (9/12 molds) — general duty wheels for a variety of applications.
- Super (12/14/16/18 molds) — for handleware (detergent bottles) and oil bottles (quart/liter size, neck-to-neck).
- Mega (18/20/22/24 molds) — for high output production of small bottles.
- Mighty (9/11 molds) — for large parts, quart oil bottles (4/cavity = 44 bottles), high clamp force, and long parison lengths.
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 or 180 point parison programming can be added
- 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. Available in paper and electronic formats. Manuals can be accessed from the machine’s PC as clickable PDFs offering helpful photos, schematics, and parts lists.

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.
SUSTAINABILITY

Graham rotary wheel machines offer unsurpassed light weighting capability for extrusion blow molded packaging. With low conversion energy and high efficiencies, wheel machines are at the forefront in offering the industry best manufacturing practices and material conservation.

Wheel machines offer the ability to incorporate Post Consumer Recycle (PCR) resin, either in a single layer, or as a middle, buried layer. Scrap generated as part of the manufacturing process can be immediately recycled into subsequent containers. And with coex capability up to seven layers, lightweight containers can be produced to replace traditional glass bottles, reducing shipping weight and breakage.

Graham wheel machines compare favorably with any type of shuttle EBM system:
• Lower resin consumption — bottle weight reduction made possible by 100% control of the parison and upward extrusion. Graham wheel machines program the parison thickness, using up to 180 increments per log. And with constant parison length and positioning, bottle weights are tightly controlled.
• Lowest weight tolerances from cavity to cavity — allowing operators to set minimal weight median targets
• Very energy efficient operation — the wheel is driven by only one or two small electric motors, providing all energy required for mold opening, closing, and clamping force
• Quieter, cleaner and more efficient through completely electro-mechanical hybrid operation. Cam driven, no timers, and no hydraulics (except for a small, low-flow unit for the parison programmer)