Midland Technologies, Inc.

Product Guide 2011

VALVE-LESS VACUUM/VENT

DIE CAST COMPONENTS

CAM-SLIDE ACTIONS

Midland Technologies, Inc.

SPECIALIZATION AND TECHNICAL EXPERTISE

Midland Technologies can help improve your bottom line and reduce your risk in a competitive industry. For more than 15 years Midland has been the leader in the design and production of valve-less vacuum and vent blocks for the die cast industry, offering the most extensive line of valve-less blocks on the market. As the industry leader in this area we deliver superior technical assistance and service with all of our products.

Along with valve-less vacuum and vent blocks, Midland specializes in select tool and mold components. These items are critical to completing a new tool or mold, but often add little or nothing to profit margins. Midland offers standard sizes and styles for each of our component lines that allow for predictability in the tool design process, easy replacement of parts, and fast delivery at prices that will allow you to protect or even improve your bottom line.

By specializing in select component lines and manufacturing in house, Midland can fill your custom design requests quickly while maintaining low pricing. If your custom part is frequently used we are able to maintain a stock for immediate shipping at your request.

Browse this Product Guide or visit us online to see our full range of products. Please contact us directly to request a catalog with complete technical details.

We look forward to working with you!

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Midland Technologies, Inc.
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Valve-Less Vacuum/Vent Technology

THE VALUE-ADDED, LOW MAINTENANCE OPTION FOR EVACUATING DIE CAVITIES

MORE QUALITY SHOTS | **LONGER LIFE** | **LESS HASSLE**

Midland Technologies is the leader in valve-less vacuum and vent technology for the die cast industry, offering the widest selection of valve-less vacuum and vent blocks on the market. Valve-less vacuum and vent technology is an effective, low maintenance solution to reduce gas porosity in parts being cast, and to reduce material loss in the form of dross. Valve-less blocks have no moving parts to replace. Midland will help you choose the correct block size, and will provide technical assistance in vacuum or vent gate and runner design in order to achieve optimal evacuation of the die cavity.

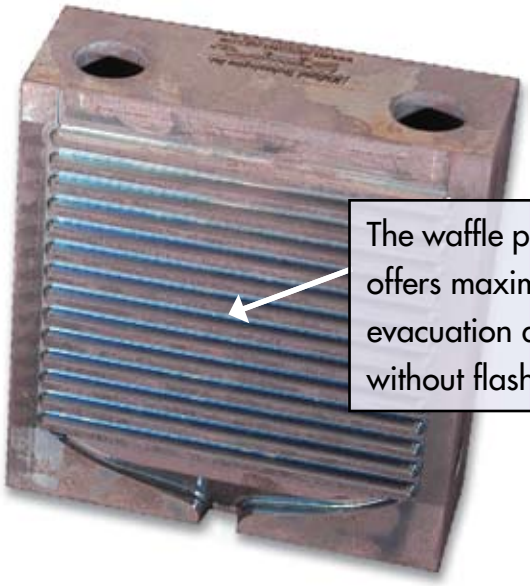
KEY BENEFITS & FEATURES

- ✔ Reduce porosity for more sellable shots per hour
- ✔ Over 100,000 shots with little or no maintenance
- ✔ No moving parts to fail or replace
- ✔ Technical assistance on runner design and sizing provided with all vacuum and vent blocks
- ✔ Custom design available or seven stock sizes for your convenience
- ✔ Use multiple blocks for increased air evacuation
- ✔ Use with aluminum, magnesium, or zinc molds – hot & cold chamber machines
- ✔ Valve-Less Vacuum and Ultimate Vent Blocks are interchangeable
- ✔ Available in premium H-13 steel, pre-hard H-13 steel, or beryllium-free copper

Ultimate Vent Block™

MORE VENT AREA, LESS DROSS

Reclaim up to 80% more material than with conventional venting as dross is reduced



The waffle pattern offers maximum evacuation area without flashing

PRODUCT OVERVIEW

The Ultimate Vent Block is a highly durable vent block with no moving parts to fail or replace. The specialized waffle pattern provides more venting area than conventional venting while significantly reducing risk of flash, a critical feature when automating the die casting cell. The Ultimate Vent Block can be interchanged with Midland's Valve-Less Vacuum Block or Valve-Less Super Chill Block with no die set modifications.

OPERATION

The Ultimate Vent Block ties into the vent runner gate providing a highly efficient means to vent gas from the die cavity. As with our entire Valve-Less Vacuum/Vent product line, Midland can customize to your specifications and will provide technical assistance at no extra cost for quick setup and effective application.

APPLICATION

The patented Ultimate Vent Block is ideal for all die casting applications that can benefit from increased air evacuation for reduced part porosity.

FEATURES

- Increased cross-section area to enhance venting
- Reduce flash and dross to save on material costs
- Seven stock sizes available or custom design to your specs
- Available in premium H-13 steel, pre-hard H-13 steel, or beryllium-free copper
- Can be water cooled
- Interchangeable with the Valve-Less Vacuum Block

PATENT NO. 7,134,637

Valve-Less Vacuum Block™

REDUCED POROSITY, REDUCED DOWNTIME

- No moving parts means little or no maintenance and down time
- Use multiple blocks for increased air evacuation

PRODUCT OVERVIEW

The Valve-Less Vacuum Block is a durable, low maintenance vacuum block for evacuating dies. It can be utilized with aluminum, magnesium, and zinc molds in either hot or cold chamber machines. Valve-Less Vacuum Blocks have no moving parts to fail, extremely long life, and can be used with or without water. Seven stock sizes are available or custom designs can be quickly produced.

OPERATION

You can use your current activation system or a simple control system can be installed using limit switches, timers, or PLC. Vacuum systems connected to a Valve-Less Vacuum Block can be activated during the injection cycle and remain on during solidification. Technical assistance on vacuum gate and runner design is provided at no extra cost to ensure quick setup and effective application.

APPLICATION

The Valve-Less Vacuum Block is ideal for die cast applications requiring low levels of porosity such as parts that are going to be painted, heat treated, or welded.

FEATURES

- No moving parts to fail
- Can be used to evacuate aluminum, magnesium and zinc molds – hot & cold chamber machines
- Available in premium H-13 steel or pre-hard H-13 steel
- Seven standard sizes available or we can customize to your specs
- Can be water cooled
- Can be retrofitted to fit most existing dies

PATENT NO. 7,134,637

Midland Materials

QUALITY MATERIALS FOR VARIOUS APPLICATIONS

PREMIUM H-13 STEEL

Premium H-13 steel is highly durable and ideal for tools used in high production runs. It is heat-treated to 44-46 HRC. H-13 steel has higher resistance to heat-check, cracking, and wear caused by thermal shock.

FEATURES:

- Durable for high production runs
- Heat-treated to 44-46 HRC
- High resistance to thermal shock

PRE-HARD H-13 STEEL

Pre-hard H-13 steel is ideal for tools to be used in production runs up to 50,000 parts. 36-40 HRC, pre-hard H-13 steel makes it cost effective to install vacuum or venting into shorter production runs.

FEATURES:

- Great for shorter production runs
- 36-40 HRC
- Melonite heat-treatment

BERYLLIUM-FREE COPPER

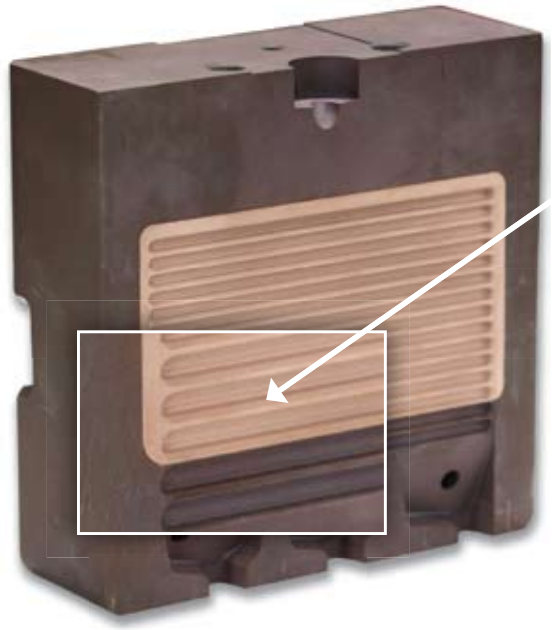
Beryllium-free copper is ideal for repeated heating/cooling cycles in situations where very high thermal conductivity is required. Beryllium-free copper has the same cooling characteristics as beryllium copper, but without the toxicity or environmental concern.

FEATURES:

- No reactivity with aluminum means less sticking
- High thermal conductivity
- No toxicity when machining

Valve-Less Super Chill Block™

FASTER COOLING, LONGER BLOCK LIFE



Beryllium-free copper inserts provide high thermal conductivity allowing for increased evacuation area that leads to quicker solidification

The H-13 steel holder of the Valve-Less Super Chill Block provides longer effective block life

PRODUCT OVERVIEW

The Valve-Less Super Chill Block utilizes a replaceable beryllium-free copper insert within an H-13 steel holder to provide high thermal conductivity and longer block life. There are no moving parts to fail or replace, reducing downtime and maintenance costs. Seven stock sizes are available or custom designs can be quickly produced to meet your needs.

OPERATION

You can use your current activation system or a simple control system can be installed using limit switches, timers, or PLC. Vacuum systems connected to the Valve-Less Super Chill Block can be activated during the injection cycle and remain on during solidification. Technical assistance on vacuum gate and runner design is provided at no extra cost to ensure quick setup and effective application.

APPLICATION

The Valve-Less Super Chill Block is the best choice when your application requires high thermal conductivity for fast cooling under repeated heating/cooling cycles.

FEATURES

- Beryllium-free copper inserts are replaceable to reduce costs
- Holder block is made from premium H-13 steel for longer block life
- Same cooling characteristics as beryllium copper without the toxicity or environmental concerns
- Seven sizes available or we can customize to your specs
- Can be water cooled
- H-13 steel inserts are available offering the flexibility to switch between copper and steel
- Fully interchangeable with Midland's other vacuum and vent blocks

Vacuum Systems

ADAPTABLE AS YOU GROW

- Our applications engineers will help you choose the right system for your operational needs

PRODUCT OVERVIEW

Midland Technologies offers complete turnkey portable and central vacuum systems, along with necessary components, for any size operation. Our vacuum systems feature the most reliable industrial-grade pumps in the industry.

OPERATION

Operation can be as simple as an on/off button on the pump, or the vacuum can be built with a complete monitoring system. Activation of the system uses a solenoid controlled by your PLC, switch, or timer. Valve-Less Vacuum Blocks ensure that the system operates with low maintenance.

APPLICATION

Vacuum systems allow for increased die cavity evacuation to reduce part porosity. Vacuum evacuation is ideal for parts that will be heat-treated, painted, or welded.

FEATURES

- Portable or Central Pumps
- Vacuum Hoses and Filters
- Monitoring System (optional)
- Valve-Less Vacuum Blocks

Casting & Molding Components

THE VALUE-ADDED OPTION FOR TOOL AND MOLD COMPONENTS

LOWER RISK **REDUCE COSTS** **DELIVER FASTER**

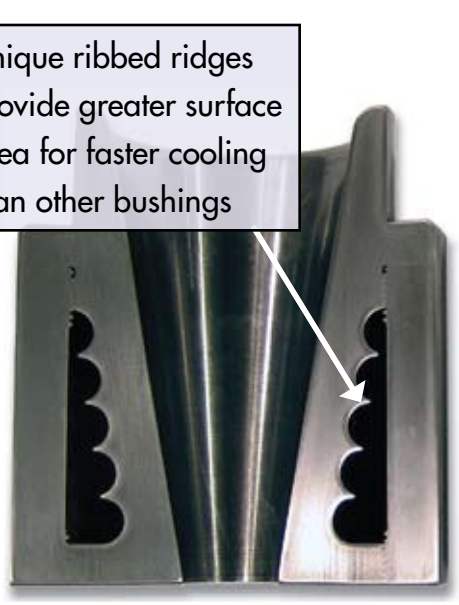
Purchasing components from Midland can reduce tool construction time, reduce internal costs, and allow you to deliver to your customer faster. By specializing in select tool and mold components we are able to offer those items to you with fast turnaround time and at prices that allow you to protect or even improve your bottom line. Midland's casting and molding components offer flexibility with many stock sizes available, or we can customize to your specifications.

KEY BENEFITS & FEATURES

- ✔ Stock sizes for your convenience or made-to-order to your specs
- ✔ Highly durable for a variety of applications
- ✔ Lower risk and reduce costs
- ✔ Reduce tool construction time
- ✔ Improve cost predictability in your tool construction process
- ✔ Easily replace worn out parts
- ✔ Order today and specify desired delivery date – we won't bill you until you receive your part

Sprue Spreaders & Bushings

FASTER CAVITY FILL AND SPRUE COOLING



- Available in small, medium, and large sizes, or we can customize to your specs

PRODUCT OVERVIEW

Die casting zinc is faster and easier with sprue spreaders and bushings from Midland. Made from premium H-13 steel and heat-treated to 44-46 HRC these components are built to last. Three sizes (small, medium, and large) and two styles (short and long) are standard, or we can customize to your specifications. Unique ribbed ridges provide greater surface area for faster cooling than other bushings. Midland bushings are threaded together and hermetically sealed to prevent leakage.

OPERATION

Spreaders can accommodate either baffle or cascade cooling. The die caster can machine one or more runners into the spreader, or request that we cut runners to custom specifications for an additional cost.

APPLICATION

Midland sprue spreaders and bushings are ideal for casting thin-wall parts with zinc.

FEATURES

- Small, medium, or large sizes
- Short and long styles
- Designs customized to your specs
- Use with either baffle or cascade cooling
- Allows faster cavity fill and sprue cooling
- Made from premium H-13 steel heat-treated to 44-46 HRC

Shot/Impact Blocks

ALUMINUM MOLDS

PRODUCT OVERVIEW

Midland offers Shot/Impact Blocks for aluminum molds in four stock sizes, or we can custom design for your unique application. Our Shot/Impact Blocks are made from premium H-13 steel and come ready to assemble. With a 3D model, Midland can machine runners to your specifications for a nominal additional cost.

FEATURES

- Ready to assemble
- Includes finished shot sleeve hole
- Biscuit pad & injection pin for runner area
- Water-cooled impact side
- Made from premium H-13 steel
- Heat-treated to 44-46 HRC

Retainer/Runner Blocks

ZINC MOLDS

PRODUCT OVERVIEW

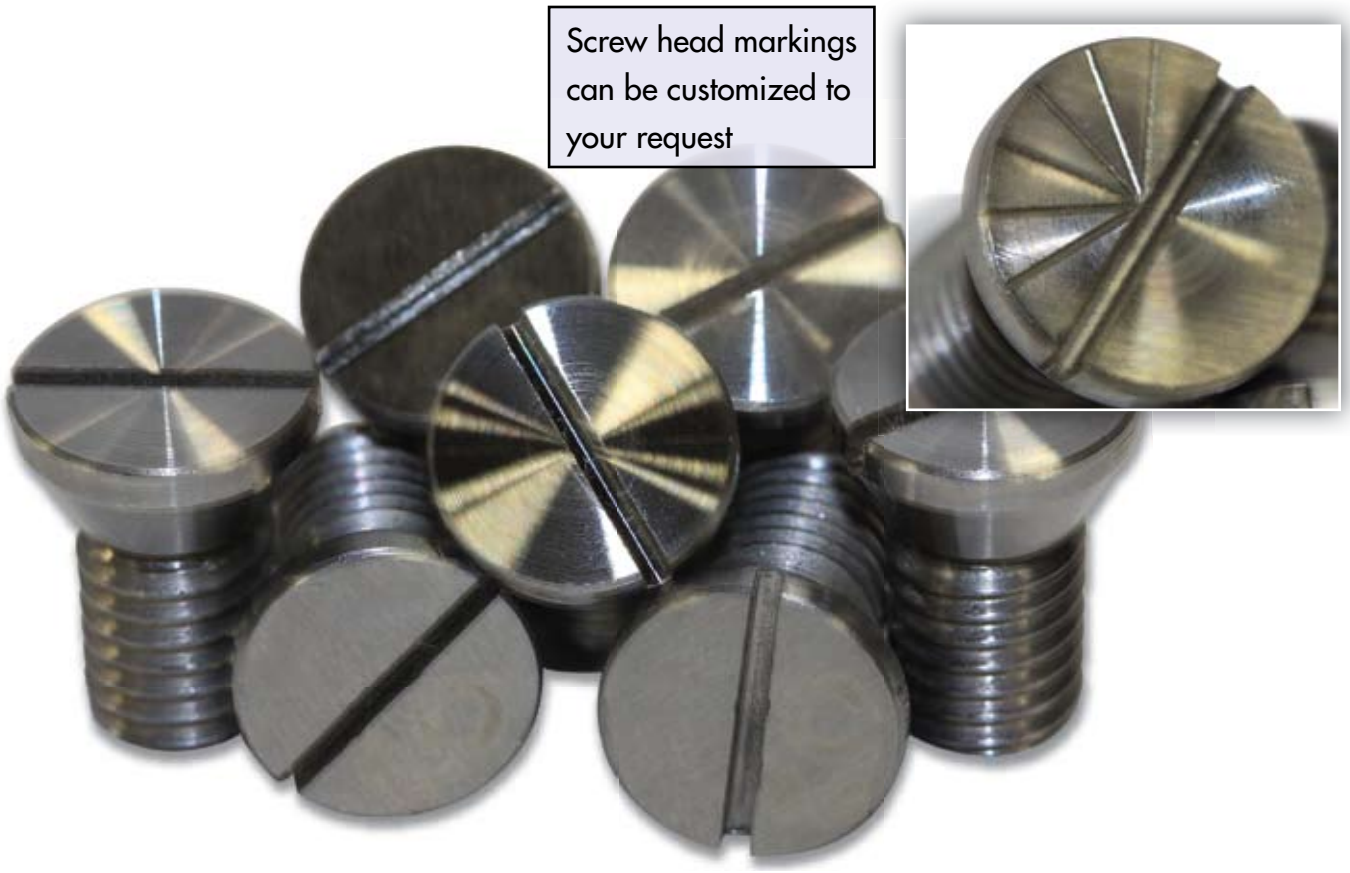
Retainer/Runner Blocks for zinc molds are available in four standard sizes, or we can quickly and affordably custom build to your specifications. Midland can machine runners per your specifications at a nominal additional cost when a 3D model is provided.

FEATURES

- Fits all sizes of DME style sprue spreaders and sprue bushings
- Made from premium H-13 steel
- Clearance holes for water-cooled bushings and spreaders
- Fits in stand-alone molds or DME unit sets
- Custom sizes available

Date Code Screws

CUSTOMIZED TO YOUR SPECS AT NON-CUSTOM PRICES



PRODUCT OVERVIEW

P20 steel date code screws are available for purchase as blanks or with your custom markings.

OPERATION

Can be inserted and removed with a flat head screwdriver.

APPLICATION

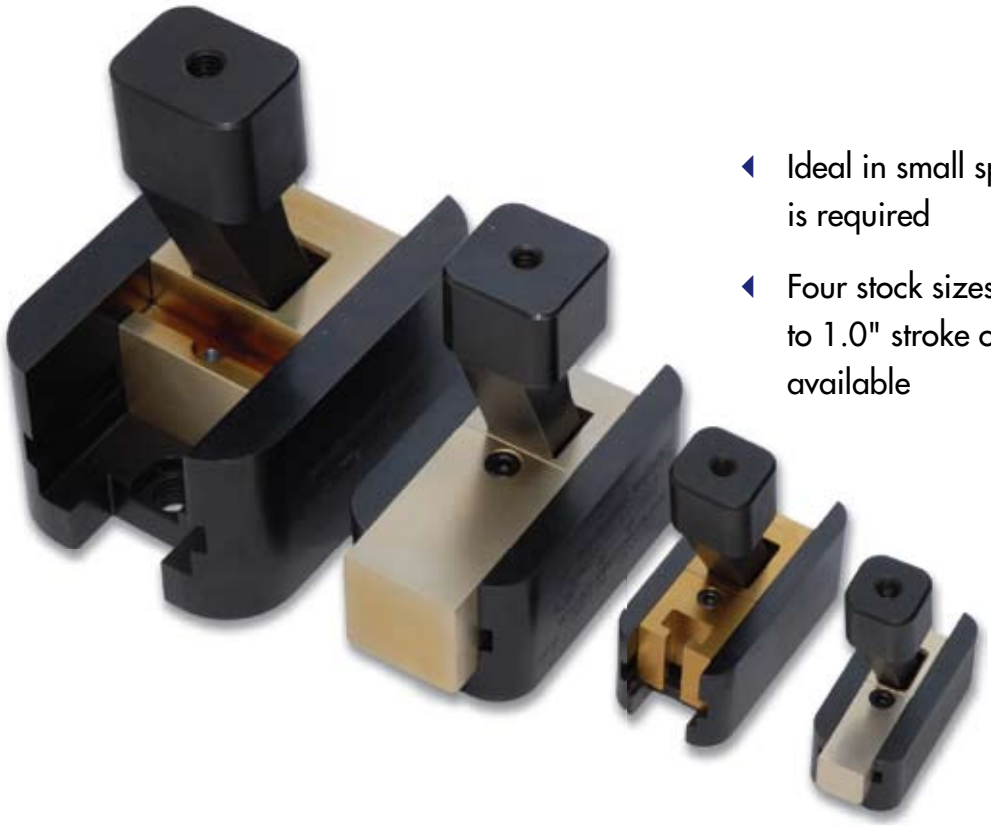
Ideal for dating casted or molded parts and batches.

FEATURES

- Purchase as blanks or head markings can be customized to your specs
- Slotted screw head for easy installation/ removal with flat head screwdriver
- Easily replaceable

Snap Cams™

PERFECT FOR SMALL SIDE PULLS



- Ideal in small spaces where detail is required
- Four stock sizes with .3750" to 1.0" stroke or custom sizing available

PRODUCT OVERVIEW

Snap Cams are small cam actuators for undercuts and side pulls. Made with high-grade tool steel, Snap Cams are highly durable in all applications. Four stock sizes are available and come ready to assemble. Midland can quickly accommodate the need for customization and design to your specifications.

OPERATION

Snap Cams are available with different inserts to accommodate core pins and part detail. They can be top or bottom mounted according to the application.

APPLICATION

Snap Cams are perfect in fine detail situations when the job requires limited space and small side pulls.

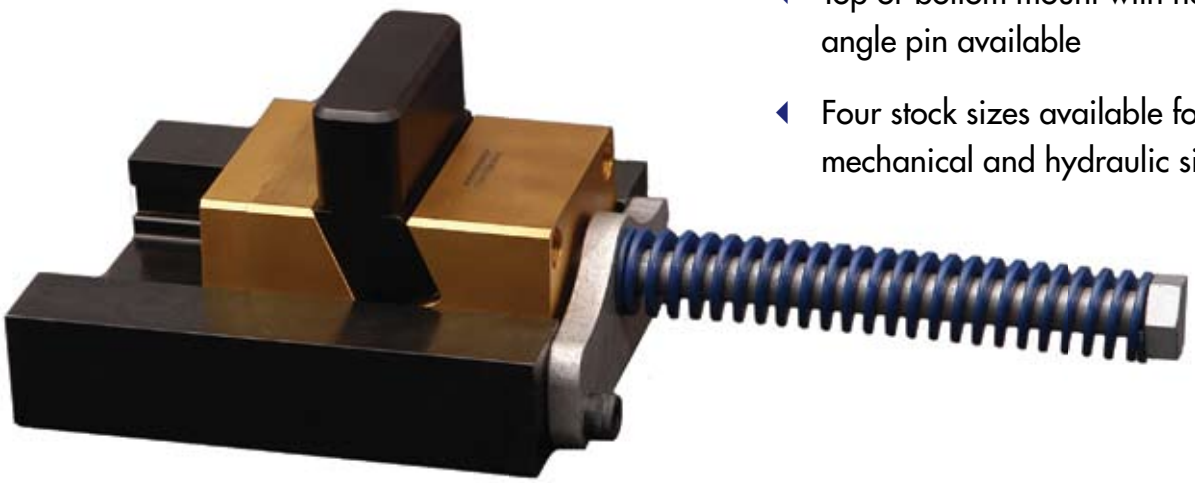
FEATURES

- Four sizes available from .3750" to 1.0" stroke
- Custom design available
- Highly durable and easy to use

PATENT NO. 7,637,305

Cam-Slide Actions™

DURABLE AND RELIABLE



- Top or bottom mount with horn or angle pin available
- Four stock sizes available for both mechanical and hydraulic situations

PRODUCT OVERVIEW

Midland offers a full array of mechanical and hydraulic cams designed to perform repeated side-actions and reduce die casting downtime. Made from premium H-13 steel, Cam-Slide Actions are highly durable. Cams can be ordered for mechanical situations up to a 2-inch stroke or hydraulically up to a 4-inch stroke. They are manufactured with pre-calculated clearances for thermal expansion to prevent seizing or galling.

OPERATION

Cams can be top or bottom mount and offer a 5° lock-up on the stationary side to locate and seal from flash. Cams can be ordered with either horn or angle pins for installation. All cams come with a slide insert. Mechanical cams come with complete springs and retainers. Cylinder couplings are available for use with hydraulic cams.

APPLICATION

Cam-Slide Actions perform repeated side-actions that help pull core pins or details such as undercuts out of parts being molded or cast.

FEATURES

- Four standard sizes or we can custom design to your needs
- Up to 2-inch stroke for mechanical situations
- Up to 4-inch stroke for hydraulic situations
- Top or bottom mount; horn or angle pin
- Mechanical cams come with springs and retainers
- Cylinder couplings available for use with hydraulic Cam-Slide Action

PATENT NO. 7,600,445

Testimonials

WHAT OUR CLIENTS ARE SAYING

"We had a four-cavity aluminum disk mold, where the part was simple and the initial inspection was positive, but during the machining process, grooves were cut across the face of the casting and we were experiencing a high rate of porosity at the deepest machined sections. This caused an 80% rejection rate! We installed two Valve-Less Vacuum Blocks from Midland. One block serviced two cavities and with the help of technicians from Midland, a proper runner was engineered. They also advised us in the set-up and operation of the system. This improved our acceptance rate to over 95%."

— Denny Schlager, Twin City Die Casting, Minneapolis, MN

"Using Midland's Valve-Less Vacuum System in our magnesium plant has helped us improve the appearance of our highly cosmetic parts to our customers' satisfaction."

— Jeff Rivers, Pace Industries – Product Technologies Division, Maple Lake, MN

"On a recent design and build program for General Motors, we were tasked to review different options to cost effectively evacuate the air and gasses from a series of new 6-speed transmission tools that AarKel Tool and Die, Inc. had been awarded. After an extensive benchmarking process to weigh the different venting and vacuum methods it was decided to utilize multiple chiller blocks per cavity that could be used to naturally vent to atmosphere or with an external vacuum system.

Numerous suppliers were evaluated for design, pricing and delivery, and in the end Midland Technologies was the supplier of choice. Midland Technologies was a local, high quality and cost effective source that met all deliveries despite several design modifications to their standard stock Chiller Blocks.

After sampling all seven different tools, we are happy to report the Midland Technologies Chiller Blocks functioned as designed in either the venting or vacuum mode without issue and resulted in excellent casting quality."

— Wes Palimaka, Lead Designer – Die Cast Division
AarKel Tool and Die, Inc., Wallaceburg, Ontario, Canada

Made-to-Order Tool & Mold Components

SAVE TIME | LOWER RISK | REDUCE COSTS

Made-to-order tool and mold components from Midland Technologies can save time and protect or even improve your bottom line. Whether your goal is to reduce time for delivery to your customer, or you are working to reduce internal costs, we can help. While you focus on cavity construction Midland can deliver the components you need to ensure high quality tools and molds.

Send us your IGES, STEP, or part design file, and we will customize the component to your needs. Order today, specify the delivery date that you require, and we will not bill you until that time. Upon request, we can stock your often used custom item so that it is ready when you need it.

MIDLAND'S TOOL & MOLD COMPONENTS INCLUDE:

- ✔ Shot/Impact Blocks
- ✔ Retainer/Runner Blocks
- ✔ Sprue Spreaders & Bushings
- ✔ Cam-Slide Actions & Snap Cams
- ✔ Date Code Screws

Ordering tool and mold components for die cast and plastic applications from Midland Technologies allows you to focus resources on your most profitable activity – building the cavity.

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Made in U.S.A.

MEMBER

NADCA
NORTH AMERICAN DIE CASTING ASSOCIATION