

## Customer Profile



### Industry & Application

- Polymer casting equipment
- Mixing machine control

### Location & Web Site

- Bolingbrook, IL
- www.giscoinc.com

## Key Benefits

### Open Control

- Gisco uses centrally located PC to control several machines and share a common tagname database
- Gisco's customers can connect other machines to PC for control

### Powerful Processing

- Polymer mixing machine uses just 5 - 10% of CPU processing, leaving time for other tasks
- Hundreds of I/O points connect to PC via Ethernet link

### Communications

- Gisco's customers can use their favorite Windows applications to track production data
- Connecting to external devices such as bar code readers is easy



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# Leading-edge Mixer for Cast Polymers uses Think & Do for Open Control

Meet Jerry Gisko, president and founder of a leading-edge company in the polymer casting industry. He's one of the few who has a last name that's virtually ready-made for an entrepreneur — founding Gisco, Inc. in 1990. Located near Chicago, Illinois, the company ships its machines to countries around the globe. Gisco is a hands-on business owner who can run a company and still stay involved in selecting key technologies that make his company's products work. Gisko explains, "We're the first in our industry to offer PC-based controls on our new products. Think & Do is helping us achieve an edge over our competition."

## A Concrete Idea...

Products made with the polymer casting process are all around us, but you may not have noticed how they are manufactured. Typical polymer products include floor tiles, electrical insulators, floor drainage channels, bathtubs, counter top laminates, and yes... even the kitchen sink. Technically, the material in products of this type is called "polymer concrete." But, the term is easy for the public to confuse with the sand-and-mortar kind, and may even have slowed the market acceptance of the technology a bit. Another term the industry gives the material (that helps avoid confusion) is "cast polymers," since it is poured into open-cavity molds for curing.

The properties of cast polymers include its resistance to chemicals, strength and rigidity. Since it hardens from a viscous liquid to a solid, the manufacturing techniques used are similar to those used with plastics or concrete. However, it is these physical properties that make cast polymers a versatile and cost-effective base material for specific types of products.

The typical ingredients in polymers include the resin, hardener, color pigment, and fillers such as sand, gravel, or calcium carbonate. A mixing machine, such as one from Gisco, blends these ingredients into a consistent mixture that can be poured into molds for curing. Product manufacturers typically mix a batch of polymer ingredients large enough to pour into several molds, depending on production requirements. The process is very time-consuming and labor-intensive, much like what brick masons do in making a batch of mortar at a job site.

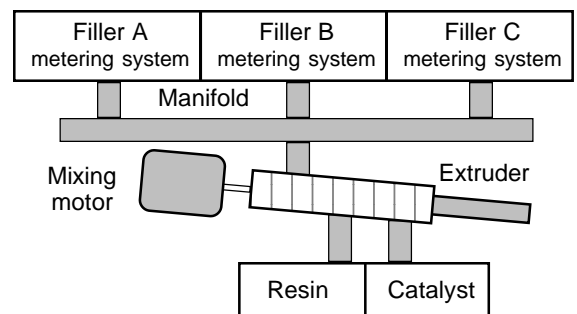
## Beyond Batch Processing

The technology in Gisco's polymer mixing machines is called "continuous casting," overcoming the inefficiencies of batch processing. With the continuous casting method, raw ingredients are mixed in the machine's output nozzle (called an extruder) just before it pours into the mold. The basic idea is simple enough for use in ice cream or yogurt dispensing machines you may have seen. For example, some machines are set up to dispense either chocolate or vanilla — and, with the lever in a certain position, it can dispense a stream of half chocolate and half vanilla. Continuous casting machines have extruders or mixing nozzles that work similarly, shown at right.

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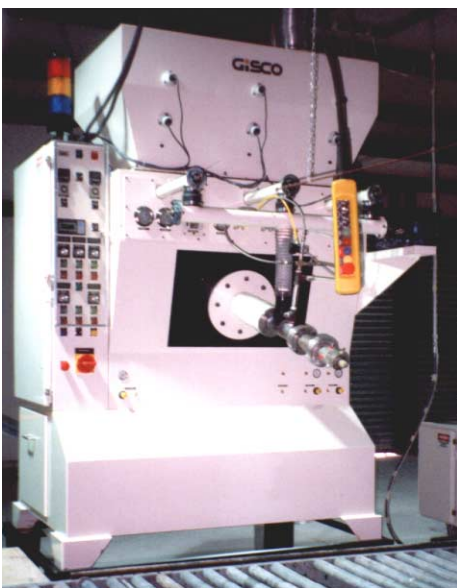
## Polymer Mixer Block Diagram



“I noticed that Think & Do software could control a mixing machine while using only 5 to 10% of the PC’s processing power. And that was only on a P166MHz PC! So I thought, why keep the PC on just one machine?” ”

Gisco’s mixers have sophisticated features that include:

- A virtually unlimited number of raw ingredients can be made available for output in the extruder (nozzle)
- Polymer ingredients can be completely mixed as quickly as they come together
- Marble-like product finishes can be created by injecting a special ingredient just past the mixing area of the output nozzle
- The machine operator can change the matrix selection (recipe) for different products on the fly — no need to start a new batch as before
- The polymer output flow rate is controlled independently from the ratios of its ingredients
- The mixer can add heat to accelerate polymer curing, and apply a vacuum for uniform porosity



*New polymer mixing machine on hoist at Gisco’s fabrication center*

With all of these features to support, Gisco’s polymer casting machines needed a solid, but adaptable controls solution.

### Controlling Mixers and More

Gisco’s polymer casting automation equipment has traditionally used small PLCs for control, with a PLC on each machine. The operator panel on a mixer provides the means to set flow rates and change polymer recipes. But in a typical cast polymer production line, the mixing of polymer ingredients is just one of several operations that include:

- Bulk filler loading
- Moving molds through the process via conveyor
- Spraying and grinding new casts
- Dust collection
- Vacuum processing for densified materials

While polymer mixing is the central operation on the production line, these ancillary operations also need control and overall coordination. With PC-based control, Gisco saw an opportunity: “I noticed that Think & Do software could control a mixing machine while using only 5 to 10% of the PC’s processing power. And that was only on a P166MHz PC! So I thought, why keep the PC on just one machine? Don’t throw away all that power.” Of course, PCs shipped with production machines have 400MHz processors (or greater) and run Windows NT. And by having the PC external to the mixer, end customers can place the PC in a central control room or office. This makes it available for:

- Controlling other machines on a typical polymer casting line
- Access to screens for diagnostics and troubleshooting
- Using Windows applications such as Excel to track raw material usage
- Displaying Gisco’s extensive on-line machine documentation

PC-based control provides a much-needed flexibility, as Gisco explains: “It controls the entire process, including material loading, recipes, material metering, conveyors, and curing ovens. Using Think & Do’s DataView, all machines in the process share the same tagname database.”



*PC with Think & Do software in control center, controlling cast polymer line*

### Remote I/O and Operator Interface

The PC in the control room uses an Ethernet network to communicate with I/O bases at the machines on the production line. Its DL205 series bases (from [Automationdirect.com](http://Automationdirect.com)) use Ethernet Base Controllers to control the I/O and connect back to the PC. “Just the mixing machine alone has over 200 discrete inputs and outputs, plus analog I/O data,” Gisco says. Think & Do software comes standard with a 12,000+ I/O point capacity, enough for the largest polymer automation projects.

Now, you may be wondering — “but what about the operator interface... since the PC and its monitor are away from the machine, in the office?” This is another aspect of Gisco’s innovative design, as he explains: “The PC’s operator screens are just for monitoring and diagnostics. The mixing machine itself has a light tree for first-level alarms. Detailed alarm information is in the PC screens. That’s also where we keep the algorithms that set the polymer matrix — it’s too sensitive to allow direct operator access. We also use Think & Do’s password feature for security. The machine uses a small operator interface panel, the Optimate 440. It has a 4-line display and keypad for the operator. It uses a serial connection to Ethernet Base Controller, making it accessible via Ethernet to the PC.” Think & Do’s I/O View maps the I/O for several operator interface devices directly to tagnames. For example, this automatically displays an ASCII variable on the operator panel via a simple I/O configuration — no programming required.

When asked if his company programs its own controllers, Gisco explains, “That is a very difficult thing to subcontract. You

have to know the industry. And just when you think the programming job is through, you may need to go back and change something. So, we do programming in-house. Think & Do flowcharts are easy to use for that. And putting remarks right on the flowchart is a good option for doing future updates. For debugging, AppTracker is a very good feature.”

The first machine to use flowchart programming gave Gisko a chance to tap various features of Think and Do. “We’re using a subchart to perform an analog filtering function. The subchart to do this even came with the software,” Gisko explains, referring to the Thinklets library of subcharts. “We’re using the data logging feature in DataView to log material usage to a flat file (comma-

delimited). Our customers can then access the data from Excel.”

Think & Do has even more capability that Gisko plans on using to further integrate cast polymer production line control. He says, “The molds will be bar coded to have the mixer automatically dispense the correct matrix (recipe) for the desired product, as well as the correct amount. This will use Think & Do software’s serial port connection to a bar code reader.”

Gisko recounts his experience with Think & Do’s application support in the field, “Those guys are great, so helpful. When I used to try to contact [a competitor], I wouldn’t get a call back from them, even by the next day. With Think & Do’s guys, it’s just hours. They’re the ultimate professionals.”

Gisco, Inc. provides turnkey solutions for entire polymer production lines, and retrofit controls as well. Using Think & Do software for PC-based control promises to keep Gisco at the leading edge of the polymer casting industry for many years to come.

For more information on how Think & Do software can help solve your application, visit our Web site at [www.thinkndo.com](http://www.thinkndo.com), or call (800)PC-CNTRL.