

HEATEC BULLETIN

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Indianapolis concrete producer heats winter mix-water with Firestorm™ water heater

IMI (Irving Materials, Inc.) is a major producer of concrete in the midwest, serving areas from Illinois to Ohio, and as far south as Alabama. Their newly-renovated ready mix plant on 96th street in Indianapolis, IN uses a new Firestorm water heater made by Heatec. The heater is a direct-contact design, providing hot water on-demand. IMI uses the heater to heat mix water during cold weather. This year IMI finished their first winter season with the heater, and they're pleased with its performance.

Direct-contact water heaters work very differently from direct-fired water tanks with fire tubes and from boilers. Typically, they are vertical cylinders with a section of diffusion material inside the top, a burner in the middle, and a collection area at the bottom. Water is sprayed into the top of the heater and migrates downward through the section of diffusion material, called packing. Packing is typically made from stainless steel formed into rings of various shapes and sizes. These "rings" provide the surface area where heat is transferred to the water from burner gasses. As the water flows downward through the packing, hot burner gasses flow upward through the falling water. The heated water collects briefly in the bottom of the cylinder and is pumped directly from there to the mixing equipment.

Unlike a direct-fired tank with a fire tube, there is no need to heat and store large quantities of water before it can be used. Direct-contact heaters heat the water on-demand. These types of heaters also take up less ground area than tanks. And unlike boilers, direct-contact heaters are not pressurized and require less maintenance.

Monte Larimore is IMI's Maintenance Supervisor for concrete operations in the entire state of Indiana. It was his decision to install the first production-model Firestorm heater. Mr. Larimore also played a major role in some of the heater's key design features.



IMI's Monte Larimore (center) speaks with a Heatec representative. In the background is the Firestorm heater with its upper access hatch and lower manway, both for internal cleaning and maintenance.

“From what we can tell so far, this heater costs about half as much to operate as a direct-fired water tank at one of our similarly-sized plants,” states Larimore.

Generally speaking, direct-contact heaters are more efficient than direct-fired tanks with fire tubes. There are a couple of reasons for this. For one, their design allows a higher percentage of heat from the burner to be absorbed by the water. Fired boilers and direct-fired tanks have to maintain higher stack temperatures in order to prevent exhaust gasses from condensing, which would cause rust and eventually interfere with burner operation. Higher stack temperatures mean more heat is being carried out of the heater. The direct-contact design readily allows water vapor in exhaust gasses to condense and mix with the rest of the heated water.

Another reason why direct-contact heaters are more efficient is because they don’t have to maintain the temperature of several thousand gallons of water. Since water is being heated and used on-demand, the burner is fired to heat only the amount of water used, *as it is used*.

According to engineers at Heatec, the Firestorm heater at IMI’s 96th street plant was designed for a water temperature rise of 120 degrees F at a flow rate of 50 gallons per minute. As Monte Larimore states, “This last winter we were running 100–120 yards per hour at this plant, and the heater kept up without batting an eye.”

“Heatec listened to me on what I thought this unit needed,” says Larimore. Based on his experience with other direct-contact heaters, one thing Larimore emphatically wanted was to have easy access to the heater’s packing material and combustion area.

As a result, Heatec designed the Firestorm heater with an upper access hatch to the packing area, and a 20-inch manway for full access to the lower half of the heater.

“I wanted access ports to the top and bottom of the heater,” Larimore states. “We have some other direct-contact heaters at other facilities, but they don’t have access to the inside of the heater. So when you’re troubleshooting, you have no idea what the packing looks like—no idea if it’s plugged up. You just know if you’re not getting the water temperature where it needs to be. With the other heaters, we have to clean them out by cycling an acid mixture through the heater a few times. With the Heatec heater, we can open the upper access hatch to inspect the pack-



Firestorm water heater at IMI’s facility in Indianapolis, IN.

ing. Then if it needs cleaning, we can pull it all out and clean it. Of course, then we have to put it back in at the top.” (*There is an additional access port on the top of the heater*). “Also, with the lower manway, we can get inside the lower section of the heater to clean it out.”

The 96th street plant uses mix water from a well. Water is pumped from the well into a storage tank that feeds the Firestorm water heater. The water is heated to temperatures of 140–160 degrees F, or even higher, to overcome heat loss absorbed by cold aggregate and ambient temperature. This ensures that the mix can still be poured at optimum temperatures around 70 degrees F.

“We do our mix temperature controlling here, on the heater’s control panel,” Larimore says. The control panel has a digital controller that allows plant personnel to enter the desired water temperature, then let the heater do the rest. “That’s the great thing about an on-demand system,” Larimore adds. “You don’t have to wait on hot water.”

“This was our first winter with the heater, so I don’t think it’s been a true test yet. But, based on my experience, I don’t foresee any problems,” states Larimore.



Control panel includes digital controller to set water temperature.

Working together on the design

“IMI is a company that is always looking for new products that might help our operations,” states Monte Larimore. “I was going to get a direct-contact heater for the 96th street plant one way or another. Heatec approached me about their new design. They were willing to work with me on some features I wanted, and I was willing to work with them on a prototype. Our working together made a good product in my opinion. I also like the fact that it’s simple. It’s easy to use. I can go to my local burner supplier or electrical store to get parts and components. That simplifies things.”

Service

As with any first-production product, there were some initial problems. However they were remedied early and in time for IMI’s winter mixing season. “Heatec Service is *definitely* good to work with,” says Brendon “Scrappy” Cash, Plant Manager at 96th street. “One day I noticed that a brass elbow on the intake had broken. I called Ron Henry (*Service Manager*) and I received the part in 2 days. Bill (*Service Technician*) in Pennsylvania is always willing to take the time to talk. I call Heatec Service, and the next thing I know, it’s done. I think they’re great.”

Heatec has several full-time service technicians based in different parts of the country. They, along with Heatec’s in-house Parts department, provide support for Heatec products nationally and worldwide.