



DriSteem improves print consistency for a national leader in commercial display graphics

RESULTS

- Lowered the reject rate for large-format digital press output from 14 percent to 2.5 percent
- Lowered the customer's electricity consumption enough to qualify for a significant utility rebate

BREAKTHROUGHS IN DIGITAL PRESS TECHNOLOGY

Modernistic is one of the nation's leading suppliers of commercial display graphics and industrial OEM products. The company, headquartered in Stillwater, MN, was founded in 1938 as a specialty die cutter. Modernistic later added commercial screen printing, and finally, acknowledging numerous breakthroughs in digital press technology, acquired their first major digital printing press in 2004. While demand for screen printing remains high, digital press technology allows Modernistic to adapt to their customers' changing needs — most notably speed, quality, and the variety of surfaces onto which their display graphics are printed.

In the early days of digital presses, customers willingly sacrificed image quality for quick turn-around times and lower costs. However, by 2013, ink and nozzle breakthroughs and improved media had advanced digital printing to a level where the image quality contended with screen printing.

We needed a system that could humidify at a high enough volume and precisely enough for the digital press room. That's where it had to work.

In 2014, Modernistic acquired a digital press capable of image resolution as high as 1200 x 1200 dots per inch and fast enough to print 61 ten-foot by five-foot sheets per hour. The keys to such ultra-high resolution and speed are ink droplet size and the number of nozzles. Each of the droplets dispensed from the printer's 42,000

nozzles has a volume of nine picoliters, which is nine trillionths of a liter. The diameter of each droplet is 5.55 microns, or 1/180th of a millimeter.

DIGITAL PRESS SENSITIVE TO STATIC ELECTRICITY

Some of the print jobs coming off Modernistic's new press had unwanted smears of ink caused by static electricity. The microscopic ink droplets, having so little mass, are extremely sensitive to even the tiniest influence. Droplets pulled off course by a static charge merge into a blob, which splashes onto the media and leaves a very visible smear. Ultraviolet light then cures the ink, including the smear, the moment it is applied. Press operator Eric Madison witnessed this phenomenon too frequently. "With too much static electricity, the reject rate can be as high as one out of every seven pieces," he explains. "We needed a better way to control static in the shop."

HUMIDIFY TO LOWER STATIC ELECTRICITY ON SURFACES

Mark Gorski, Modernistic's vice president of operations, knows the pitfalls of poor air quality in a print shop. Long before new digital press went online, Gorski had implemented systems for maintaining indoor air quality throughout the plant. The building's entire air volume was circulated several times a day through a garage-sized bank of ultra-fine



One of the 165 atomizing nozzles in over a quarter mile of tubing throughout Modernistic's 160,000-square-foot facility.

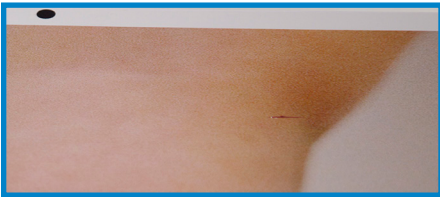
How small is nine picoliters?

If a liter of ink is spread out so each nine-picoliter droplet occupies one square millimeter, the area covered will completely encompass 224 one-hundred-yard football fields from goal line to goal line and from sideline to sideline. Rearrange the droplets so they are touching, and the area covered will encompass less than one yard of one football field from sideline to sideline.

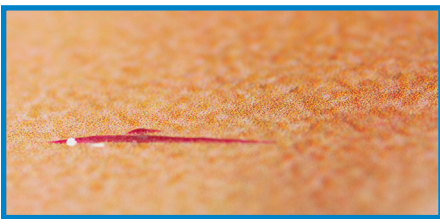
A STUDY IN STATIC ELECTRICITY



A national retailer's display graphics are printed four-up on Modernistic's digital press.



There is a smear in the top panel.



Close-up of smear shown above. Static electricity causes individual ink droplets to merge into a blob. This graphic was rejected.

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DriSteem U.S. operations are ISO 9001:2015 certified

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Form No. Modernistic-1016

filters. Air temperatures were carefully monitored and controlled in each of the four print rooms. Even the forklifts used only the cleanest-burning fuel, and a boiler as old as the 1970s building produced steam for humidification.

"But we needed a humidification system to replace the old boiler," recalls Gorski. "A system that could humidify at a high enough volume and precisely enough for the digital press room. That's where it had to work. Even in the winter."

LOWER REJECT RATE ON THE DIGITAL PRESS

DriSteem's high-pressure system is the perfect solution for Modernistic, because it provides high-capacity humidification along with flexibility in multiple zones, and all with a single pump station. Plus, the evaporative cooling effect offsets the building's cooling load.

DriSteem's high-pressure system has been running at Modernistic since the fall of 2015. Asked about the reject rate on his digital press, Madison said, "It's down to 1 in 40."



Eric Madison operating Modernistic's digital press. The company agreed to this case study on the condition that DriSteem's high-pressure system could meet this room's humidification demand through a Minnesota winter.

RESOURCES

For more information on DriSteem's evaporative cooling and humidification, go to: [Evaporative cooling humidification](#)

To download DriCalc, DriSteem's free sizing and selection software, go to: [Register for DriCalc](#)

For more information on finding your local DriSteem representative, go to: [Find-a-rep](#)

For more information on Modernistic's latest digital press (pictured above), go to: [Inca Onset Q40i press release](#)