

COMMERCIAL
PRINTING

HUMIDIFICATION
BUYER'S GUIDE



WHY HUMIDIFY COMMERCIAL PRINTERS?

Controlling humidity is an important consideration for print providers. Proper humidification levels alleviate a variety of issues in the pressroom, including electrostatic discharge (ESD) and paper curl, while contributing to a healthy work environment and improving printer function.¹

- **Electrostatic discharge (ESD):** Overly dry air allows static charges to accumulate which can lead to quality problems like stray ink marks. These mistakes increase the rate of rejection and increase the amount of material that is thrown away – which is detrimental to the company's bottom line. Static charges can also cause damage to sensitive electronic equipment, causing work to come to a halt.
- **Paper moisture levels:** With digital printing, the amount of moisture content in the paper can impact the toner adhesion and cause problems with the roller temperature, resulting in paper jams. With digital printing, you need the paper to have around a 50-55% relative humidity (RH) for optimal printing. If the humidity level falls below 40% RH, the paper loses water and will start to change shape. It can even cause electrostatic charges between the other paper it is in contact with and cause it to stick together and attract dust.²

In offset printing, the moisture content can affect the interaction between the ink to the press, the paper to the press and the ink to the paper. What you need is a higher moisture level of about 55% RH in the press hall. If the RH is lower, the dry air will cause issues, such as curling, creasing and dot doubling. In low humidity, electrostatic buildup is also common and can also cause misfeed, as well as problems with stacking, trimming and folding when the paper starts sticking together. And when the paper makes another pass through the printer, it can change shape again and cause cracking along the folds once finished.²

- **Healthy work environment:** Humidification improves indoor air quality because it diminishes the bacteria and viruses that thrive in dry air.⁵ Employee absences increase during the dry winter months, often due to chronic respiratory illnesses. Research has established that flu outbreaks can be predicted 14 to 16 days after outdoor humidity bottoms out in the continental United States.³ Studies have shown that when room relative humidity (RH) drops below 40 percent, absenteeism increases due to respiratory illness. Proper humidification can reduce absenteeism as much as 18 percent.⁴
- **Improving printer function:** Machine operations also become more efficient because proper humidity levels directly contribute to less downtime. This is due to the assurance of fewer paper jams and less paper sticking together, among other reasons. Overall, printing in a well-balanced, humid environment will provide a consistent level of quality and result in reduced waste and a longer life-cycle of cylinders and plates.²



SOURCES

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3. "Humidity as a non-pharmaceutical intervention for influenza A." PLoS ONE, 2018, <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0204337>.
4. "Improving Indoor Air Quality With Humidity." BUILDINGS Magazine, 2002, <https://www.buildings.com/article-details/articleid/900/title/why-humidify->
5. E.M. Sterling, Criteria for Human Exposure to Humidity in Occupied Buildings, 1985, ASHRAE.

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U.S. Headquarters:
14949 Technology Drive
Eden Prairie, MN 55344
800-328-4447 or 952-949-2415
952-229-3200 (fax)
Email: inquiries@dristeem.com

European office:
Grote Hellekensstraat 54 b
B-3520 Zonhoven
Belgium
+3211823595
Email: dristeem-europe@dristeem.com

WHY CHOOSE DRISTEEM HUMIDIFICATION SYSTEMS?

COMMITTED TO QUALITY

DriSteem has been designing and building world-class humidification business for more than 50 years and is committed to making the best products in the HVAC industry.

DriSteem humidification systems are made to fit each unique application, whether it is ensuring the success of critical industrial processes, preserving fragile and valuable museum artifacts, or protecting the health and well-being of building occupants. DriSteem's mission is to support healthy environments – studies show that when room relative humidity (RH) drops below 40 percent, incidents of respiratory illness increase but by adding proper humidification, student and employee absenteeism can be significantly reduced.

DriSteem U.S. operations are ISO 9001:2015 certified and committed to providing high-quality products, efficient services, on time delivery, and innovative solutions.

SUPPORT & RELIABILITY

DriSteem sales representatives are the industry experts in humidification systems, and are trained to recommend and specify the best solution for any application. They are willing to go the extra mile to make sure everything runs smoothly at start-up and for the life of the equipment.

DriSteem stands behind their products with a world-class Technical Support team available to troubleshoot any issues that may arise. They can also provide start-up assistance and offer field service visits.

CASE STUDIES & RESEARCH

Support your business case with data – DriSteem is continually adding to our collection of white papers and case studies.

DriSteem worked with Modernistic, a leading supplier of commercial display graphics and industrial OEM products. DriSteem's high-pressure system was 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.

The results speak for themselves. The DriSteem High-pressure System:

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

For the full case study, go to: <http://www.dristeem.com/humidity-university/case-studies/case-study-dristeem-helps-improve-print>.

DriSteem has also published a white paper about the types, applications and benefits of adiabatic humidification, with a focus on high-pressure systems. Learn how adiabatic humidification can reduce cooling loads and energy costs at: https://dristeem.azureedge.net/public-documents/docs/default-source/azure-public/white-paper/hpas_white_paper_adiabatic_basics.pdf?sfvrsn=2



DRISTEEM SOLUTIONS

HIGH-PRESSURE SYSTEM

A high-pressure system can be an excellent solution for commercial printers, 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.

- Pressurized water sprayed through small orifice nozzles
- Very low energy use
- Requires reverse osmosis or better water
- Very low maintenance:
 - Water-cooled, water-lubricated pump
 - 8000 hours between maintenance checks
 - Will flush system so no standing water in systems
- Medium to large capacities from 250 to 5500 lbs/hr



HIGH-PRESSURE SYSTEM

WATER TREATMENT SYSTEM

DriSteem's water treatment systems to remove over 98% of dissolved solids, significantly reducing or eliminating humidification equipment maintenance.

- Softening prevents hard scale formation.
- Reverse osmosis (RO) removes 98% total dissolved solids (TDS) from the supply water prior to entering High-pressure System.
- Minimal down time to change membranes.

Designed to be used as stand-alone systems or with DriSteem's humidification and evaporative cooling products, DriSteem's water treatment systems are also capable of supplying high-purity treated water for any process.

