

CLEANROOMS

HUMIDIFICATION BUYER'S GUIDE



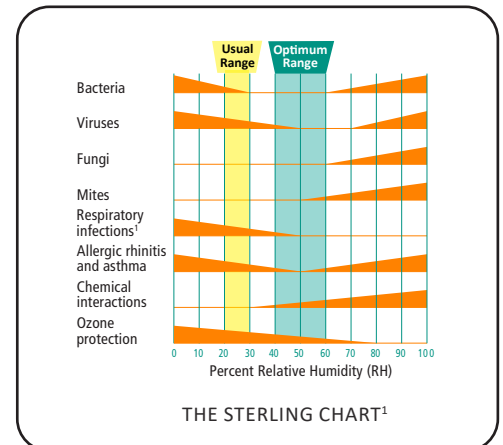
WHY HUMIDIFY CLEANROOMS?

Ensuring optimal environmental conditions in cleanrooms is crucial for achieving desired outcomes. However, the frequent exchange of air required to maintain air quality and sterility can lead to variations in relative humidity (RH), which in turn create challenges with equipment, chemicals, and measurements. The ASHRAE¹ Handbook recommends that laboratory and cleanroom facilities maintain the relative humidity level between 35 - 60 % RH.

Relative humidity levels that are too high or too low can interfere with test results. Whether from a brief interval when an HVAC system starts up or from season changes, the slightest fluctuation in humidity can affect the accuracy of sensitive testing. In an uncontrolled environment the life span of expensive equipment such as spectrometers and electronic microscopes can be notably reduced. In addition, equipment warranties may be void if specifications are not met.

Static electricity discharges caused by low or fluctuating RH levels can damage valuable equipment and disrupt critical processes. When humidity levels are lower than 45% RH, equipment may experience static buildup which can cause materials to dry out and become brittle. Too much humidity creates an ideal environment for viruses, bacteria, and mold to grow, compromising the integrity of materials.

There are real costs associated with health issues caused by dry air, including a higher incidence of infections and increased rates of staff absenteeism. Dry indoor air can lead to discomfort such as dry skin, eyes, and throat for both employees and visitors. On the other hand, humidified spaces create a sense of warmth and enhance comfort for workers, resulting in improved productivity through heightened concentration and reduced fatigue.



ISSUES CAUSED BY LOW OR FLUCTUATING RELATIVE HUMIDITY

- Inconsistent test results
 - Humidity levels that are too high or too low can interfere with test results.
 - The slightest fluctuation in humidity can affect the accuracy of testing.
- Damage to sensitive equipment
 - Static can build up which will allow contaminants to collect on equipment.
 - The life span of expensive equipment such as spectrometers and electronic microscopes can be notably reduced.
- Staff illness and discomfort
 - The use of humidification can help to reduce the spread of viruses like COVID-19 (SARS-CoV-2) and seasonal influenza helping to protect the wellbeing of staff.



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.

Boston Scientific-Cork Ltd. (BSCL), a manufacturer of heart surgery stents, faced the challenge of ensuring precise and continuous humidification within 1% of the set point. The existing humidifiers were unable to meet this control requirement.

To address these challenges, BSCL replaced existing electrode humidifiers with fourteen DriSteem resistive-element Vapormist® humidifiers in their stent production areas. The Vapormist humidifiers ensured that the relative humidity (RH) in BSCL's production rooms remained within 1% of the set point, as required. The steam was effectively dispersed using Rapid-sorb dispersion panels in the seven air handling units. The humidifiers were strategically distributed throughout the air handling units, with some units accommodating up to three humidifiers based on the load requirements.

By implementing DriSteem resistive-element Vapormist® humidifiers, Boston Scientific-Cork Ltd. (BSCL) successfully overcame the challenges associated with maintaining precise control and efficiency in their stent production areas. The new humidifiers ensured continuous and accurate humidification within a tight range of the set point, addressing the limitations of the previous electrode humidifiers. This improvement not only enhanced the quality of their critical operations but also contributed to cost savings through reduced energy consumption, lower maintenance expenses, and optimized resource conservation.

See the full study here: [Boston Scientific reduced energy and maintenance costs with DriSteem humidifiers](#)



DRISTEEM SOLUTIONS

The implementation of humidification systems within the HVAC system of cleanrooms is crucial to mitigate the adverse consequences of fluctuating and low relative humidity (RH) levels. DriSteem's advanced humidification systems are tailor-made to meet specific application needs and play a vital role in protecting against issues associated with RH fluctuations and low humidity.

By ensuring optimal conditions within cleanroom environments, these humidification systems help safeguard critical operations and maintain ideal working conditions. See below for some humidification system options that DriSteem offers for cleanrooms.

Learn more about the right solution for your building and energy needs: go to [DriSteem.com](#) and click on [Find a Rep](#) to connect with a DriSteem representative near you.

ADIATEC® ULTRASONIC HUMIDIFIER

Provides evaporative cooling and humidification in room or in AHU/duct for application flexibility

- › 93% less energy required compared to isothermal humidifiers
- › ±1% controllability with modulating demand signal and constant temperature/airflow control



Adiatec ultrasonic humidifier

RTS® HUMIDIFIER RX SERIES

Compact, elegant, cabinet-style electric humidifier – perfect for finished spaces

- › Incorporates universal water control for use with any water type: tap, softened, or RO/DI
- › Smart drain technology adjusts drain intervals automatically
- › Accurate, responsive control with Vapor-logic® touchscreen controller



RTS humidifier RX series

GTS® HUMIDIFIER LX SERIES

The only gas-fired humidifier that combines the highest efficiency on the market with ultra-low NOx in a single design.

- › Condensing design for highest efficiency and PVC venting.
- › Smart drain technology adjusts drain intervals automatically based on water quality.
- › Universal water control for use with any water type, including RO/DI water.
- › Accurate, responsive control with Vapor-logic® touchscreen controller



GTS humidifier LX series

HYDROTRUE® WATER TREATMENT SYSTEMS

DriSteem's family of water treatment systems are designed to be used as stand-alone systems or with DriSteem's humidification and evaporative cooling products.

- › Reverse osmosis water treatment systems significantly reduce or eliminate maintenance on downstream equipment by removing over 98% of dissolved solids from supply water.
- › Operating with softened water reduces or eliminates hard water scale on equipment surfaces, thereby significantly reducing humidifier maintenance requirements.
- › Dechlorinator systems protect reverse osmosis membranes from chlorine damage.



Hydrotrue water treatment systems

FOR MORE INFORMATION

Facility Executive: Laboratories and Cleanrooms – The Impact of Humidification on Process, Health
facilityexecutive.com/laboratories-cleanrooms-impact-humidification-process-health

Science Direct: Outdoor environmental effects on cleanrooms – A study from a Swedish hospital pharmacy compounding unit
[Outdoor environmental effects on cleanrooms – A study from a Swedish hospital pharmacy compounding unit](https://www.sciencedirect.com/science/article/pii/S1359431120300000)

ResearchGate: A Humidex For The Cleanroom – Why Temperature And Humidity Control Matters
www.researchgate.net/publication/352853275_A_Humidex_For_The_Cleanroom_Why_Temperature_And_Humidity_Control_Matters

International Society for Pharmaceutical Engineering (ISPE): Temperature & Humidity Requirements in Pharmaceutical Facilities
[ispe.org/pharmaceutical-engineering/september-october-2021/temperature-humidity-requirements-pharmaceutical](https://www.ispe.org/pharmaceutical-engineering/september-october-2021/temperature-humidity-requirements-pharmaceutical)

Semiconductor Digest: Why control humidity in a cleanroom?
[sst.semiconductor-digest.com/2003/10/why-control-humidity-in-a-cleanroom](https://www.semiconductor-digest.com/2003/10/why-control-humidity-in-a-cleanroom)

NEXT STEPS

Humidification technology can be installed either as a retrofit for existing buildings or for new construction. The type of indoor space, air quality goals, energy source, desired maintenance, capacity, etc. will determine the best technology for each building. Of course, energy management and the analysis of energy usage drive the selection of humidification efficiencies and sustainability.

If a building currently does not have a humidification system, it is time to add one to protect processes, equipment, health, and safety. If a humidification system exists, it should be reviewed to ensure it is properly sized, operating correctly, and energy efficient since building usage often changes over time.

Optimize your operations and ensure the success of your research. Go to [DriSteem.com](https://www.dristeem.com) and click on [Find a Rep](#) to connect with a DriSteem representative near you.

SOURCES

1. ASHRAE Handbook, www.ashrae.org/technical-resources/ashrae-handbook

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