Why humidify?... For Wind Energy

Ensuring proper humidification in your facility will improve production output, elevate product quality and ultimately, boost ROI

- Improve curing rates & manufacturing yields
- Lower process generated dust levels
- Enhance paint & coating quality
- Reduce static build up & ESD
- Boost ROI through energy efficient cooling

Dehumidification, Humidification and Evaporative Cooling

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Improve product quality and production efficiency with proper humidification

The manufacturing process requires effective humidity control to operate efficiently. Insufficient humidity can impair coating applications and curing rates, resulting in damaged components, waste and decreased production output. Improve production output, elevate product quality and boost ROI with improved humidification control in your wind turbine and / or blade component manufacturing facility.

Improve Manufacturing Process Efficiency

Ensuring ideal humidity levels throughout the manufacturing process is integral to product quality and output efficiency.

Support Proper Curing Rates, Reap Higher Manufacturing Yields and Decrease Waste

The final product yielded through the manufacturing process is affected when additional components, parts or materials are required due to broken, damaged or inoperable items caused by incorrectly controlled environmental conditions. Conversely, when equipment is correctly manufactured throughout the normal process, waste levels decrease and products are completed and shipped in accordance with the designated build of materials and targeted time frame.

Ensure Manufacturing Efficiency and Product Consistency with Humidity Control

Quality of product and efficiency in wind turbine and / or blade component manufacturing is delivered with a controlled indoor environment of 40-60% RH. This provides the ideal environment for proper curing and component consistency, which ultimately leads to higher yields and less waste on behalf of the manufacturing facility.

Improve Dust Suppression During Sanding Process

Static electricity problems in a blade (composite) manufacturing environment occur when dry air causes surfaces to become charged with static electricity. This contributes to a variety of problems including dust fires and static explosions.

Create and Maintain a Manufacturing Environment Free of Dust Particles

Inadequate humidity escalates the development of dust and the intensity of dust swirl in indoor spaces. Maintaining an adequate humidity level throughout your production facility ensures that the dust in the air is enclosed in a film of water. The dust particles absorb the humidity in the air and fall to the ground, where they can be removed with ease during normal cleaning processes.

Ensure Effective Dust Suppression with Humidity Control

Suppress dust during sanding operations by maintaining a consistent humidity level of 40-60% RH throughout your facility. A correct humidification level lowers the risk of dust explosions for dust from combustible materials. Adequate humidity cleans the air of dust faster, reducing the risk of fine dusts in the air, which can cause potential problems to your employees if inhaled and can undermine the production of your products. Proper air humidification also offers odor neutralisation, an important added benefit of air humidification.

Consistent Quality During Paint Application

Paint and coating applications require specific temperature and RH requirements. Proper humidity is required for effective adhesion for coatings requiring a controlled electrostatic charge.

Electrostatic Painting and Powder Coating Booths

Economic and environmental imperatives such as waste reduction, overspray control, particulate recovery and solvent reduction mean that electrostatic paint and powder

coating is now very widely used. The process is dependent on maintaining consistent humidity levels.

If the RH is too high, then the effects of electrostatic charge are disrupted, coat adhesion is affected and higher flow rates are required for the same finish. In low relative humidity, the charging characteristics of the corona are affected so the powder does not become properly charged, and there is lower transfer efficiency between the powder and items being coated, leading to inadequate film thickness and Faraday cage effects. Costs rise and waste increases as a result.

Controlling the Painting and Coating Environment

Commonly, control over air temperature and RH will be provided by an air handling system, fitted with a humidifier, delivering conditioned air directly to one or more spray booths. This might be supplied by the booth manufacturer or designed separately and supplied by an air handling unit (AHU) manufacturer.

For individual spray booths, an associated AHU may be incorporated into the system for humidity control. Alternatively, a positive pressure containment room could be created, conditioned to provide the appropriate temperature, RH and air filtration required for specific applications.

Ensure Consistent Quality During Paint Application with Humidity Control

By ensuring an ideal environment of 70% RH throughout your facility, you will be able to better maintain consistent quality during paint and coating application. These conditions are key for proper electrostatic paint and powder coating application and paint booth environment control. Without proper control, coating adhesion and durability are compromised, undercutting your product.

Eliminating Static in Electronics Assembly

Electrostatic discharge (ESD) occurs with the sudden flow of electricity between two electrically charged objects coming into contact with one another. When objects holding different charges come into contact, or when the dielectric between them breaks down, a visible spark can be triggered, which can damage electronics and pose safety concerns for facility operations.

Eliminate ESD with Humidity Control

Maintaining a consistent humidity level between 40-50% RH lowers surface resistance on manufacturing equipment and products, as well as on communal areas including floors, carpets, table mats and other susceptible areas. When humidity levels drop below 40% RH, this protection disappears and routine employee activities lead to objects being charged with static electricity, posing a safety risk of serious shock for employees and increasing the possibility of damage to or defects within electronic components and devices.

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Improve Energy Efficiency and Cost Savings through Adiabatic Cooling

Evaporative or adiabatic cooling is a process that introduces liquid water directly into the air without the need for adding thermal energy (heat) to the water. As the water evaporates, it draws heat from the air to drive the phase change from liquid to vapor. Evaporative or adiabatic humidification systems installed directly in a ventilation airstream result in both increased humidity and cooling of the air. Reducing mechanical cooling requirements offers significant energy savings for manufacturing facilities.

Customizable Facility Solutions: Indirect Evaporative Cooling

In climates where direct evaporative cooling in the ventilation air stream is not practical due to warm and humid outdoor conditions, a different approach called indirect evaporative cooling can be employed. Indirect evaporative cooling involves placing an evaporative cooler into the exhaust airstream. This air is then cooled as much as possible and directed through an air-air heat exchanger where it pre-cools incoming supply air. The moist air is then exhausted from the building. The result is a reduction in mechanical cooling requirements without adding moisture to the building.

Improve Energy Efficiency with Evaporative Cooling Solutions

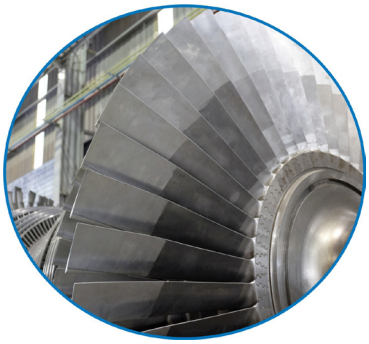
Adiabatic humidification solutions allow a facility to experience reliable and consistent humidity levels and air quality conditions, while also providing an opportunity to greatly reduce energy use required for cooling. Implementing an evaporative cooling humidification solution allows a facility to run at optimum efficiency, reducing energy and operation costs.

Effective humidity control poses a long list of benefits for wind energy manufacturing:

- Increase production output and productivity
- Boost ROI of facility production and operations
- Maintain and improve product quality
- Improve facility and operations safety
- Decrease waste from damaged components

Condair's Wind Energy Customers Include:

- **LM Wind Power**
- **Siemens**
- **Vestas**
- **GE**



Condair manufactures a comprehensive range of humidifier and evaporative cooling systems across all humidification technologies. Condair's humidification engineers are able to provide the right solution to meet the needs of every environment. Contact us today and ensure you have the best humidification solution for your wind energy facility.

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