

THE ROLE OF DEW POINT IN SUSTAINABLE ENVIRONMENTAL MANAGEMENT

Overview

- » The Dew Point determines the preservation environment that can be achieved because it determines what combination of Temperature and Relative Humidity can be achieved
- » Temperature (T), Relative Humidity (RH), and Dew Point are interrelated
- » At a constant Dew Point – as the T rises, the RH falls, and as the T falls, the RH rises
- » Dew Point is typically the limiting factor of a mechanical system’s ability to provide a good environment for long-term preservation of collections

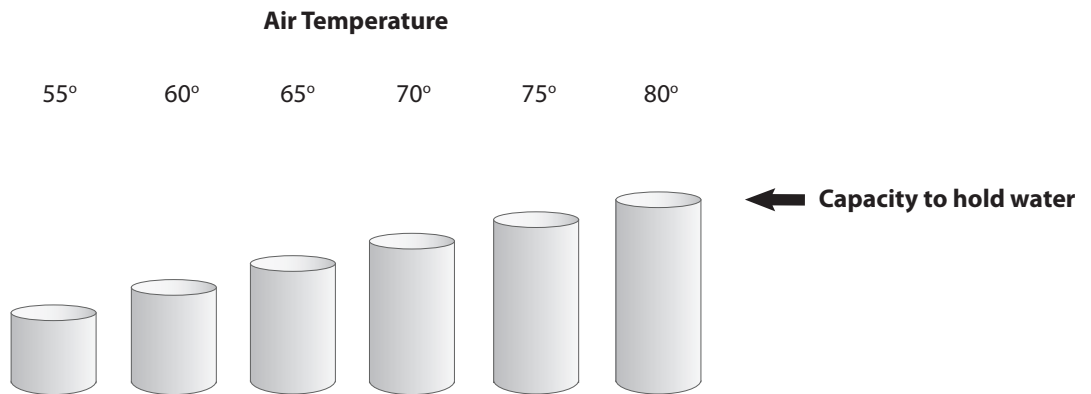
General Recommendation for Preservation:
 Make it as cool as you can while maintaining a moderate RH – understanding Dew Point is the key.

Understanding Dew Point

The Dew Point is the temperature at which air containing a specific amount of water becomes saturated. Dew Point can be used as an indicator of the total moisture content in an environment. Think of the diagrams below as a series of “buckets” – the bucket size increases or decreases with temperature (A), while the amount of water in the bucket remains the same regardless of the temperature change (B).

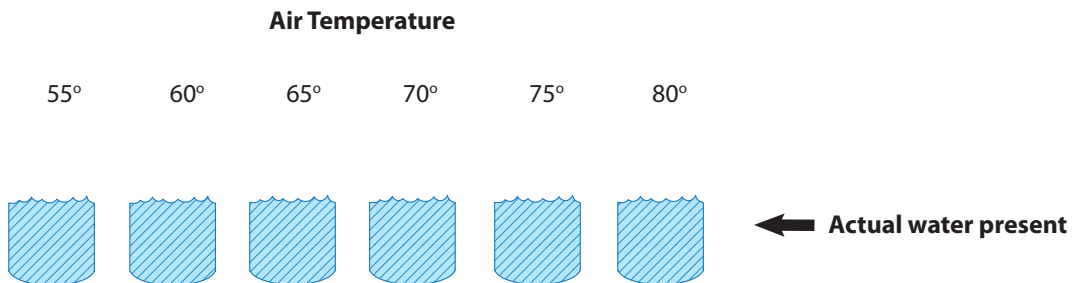
(A)

The capacity of air to hold water increases as air is warmed, and decreases as air is cooled



(B)

The actual amount of water in the air does not change with changes in air temperature



Use IPI’s Dew Point Calculator to learn more about how dew point, temperature, and RH interrelate at: www.dpcalc.org

Click to Solve for:

Temperature
 % RH
 Dew Point

68 24 30

Temperature Scale: F C

Preservation Evaluation

Type of Decay	Environment Rating	Preservation Metric
Natural Aging	GOOD	PI 89
Mechanical Damage	OK	% EMC 5.2
Mold Risk	GOOD	Days to Mold No Risk
Metal Corrosion	GOOD	% EMC 5.2

Record and Compare Values

T	RH	DP	PI	Days to Mold	EMC
68° F	66%	56° F	29	No Risk	12.2%
68° F	48%	48° F	46	No Risk	9%
68° F	24%	30° F	89	No Risk	5.2%

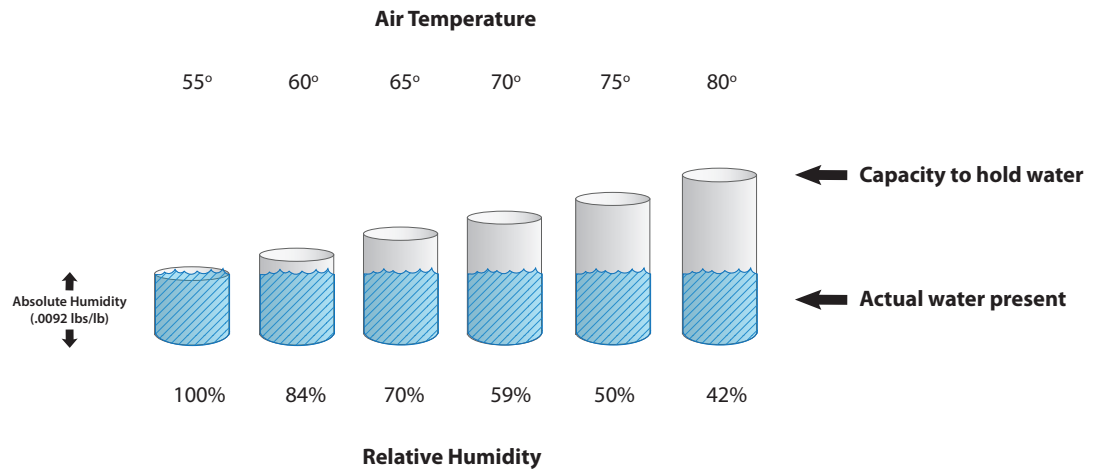
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THE ROLE OF DEW POINT IN SUSTAINABLE ENVIRONMENTAL MANAGEMENT (CONT'D)

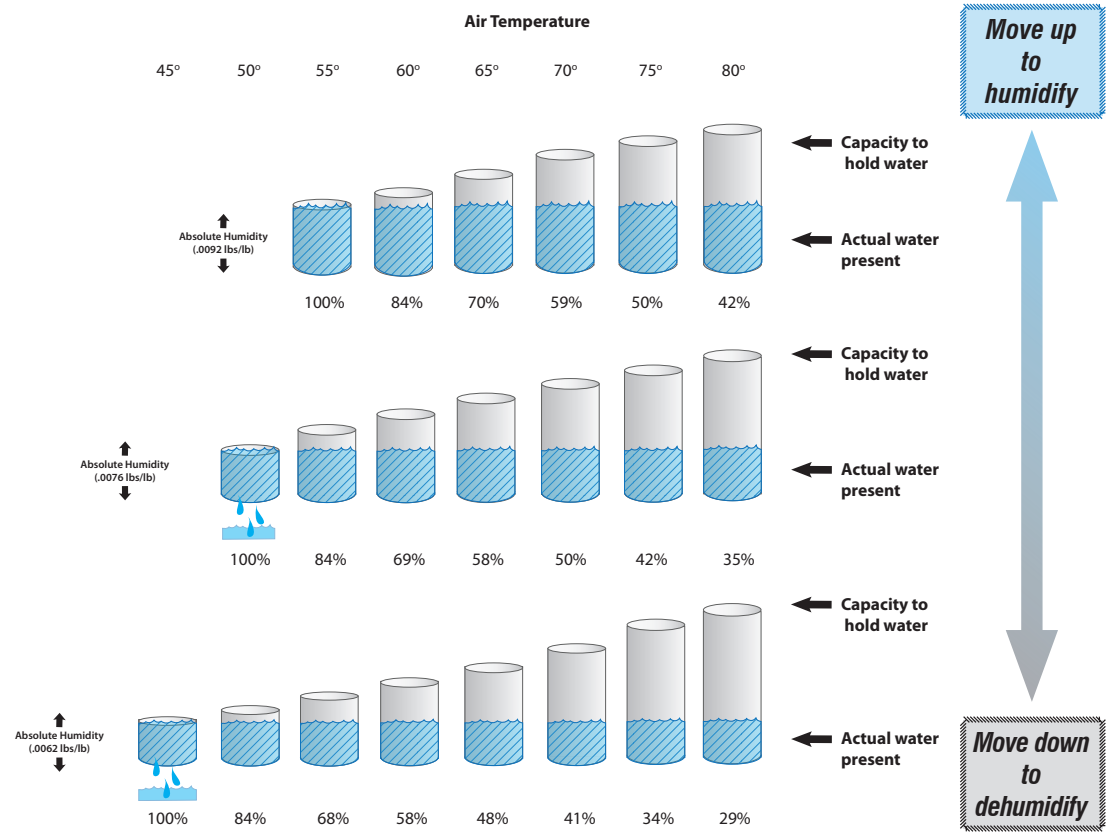
Relative Humidity is the percentage of the bucket that is full based on the moisture content of the air (actual water present) and the capacity of the air to hold water (based on temperature) **(C)**.

(C)

Relative Humidity represents how saturated the air is with water vapor



The environment is at its Dew Point when the air is completely saturated – i.e., 100% RH. The dew point can be reduced by cooling the air below the current dew point (dehumidifying to remove moisture), which reduces the capacity of the air to hold moisture (shrinking the bucket). Excess moisture in the system will condense out. The lower the dew point, the lower the RH can be maintained at cool temperatures.



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