

Instruments for the Additive Manufacturing Industry

Reduce the Impact of Moisture on 3D Printed Parts

Raw Material Storage

The raw materials - powders, resin or filaments - are more or less hygroscopic materials. What this means is that these materials will absorb humidity from ambient air. High moisture level of the raw material will cause changes in its properties and may have many unwanted effects in the product quality.

Sintering Process

In a sintered furnace, controlling the dew point of the atmosphere gases helps to prevent defects caused by elevated moisture levels.



Optional Sample Cells



DMT143 Dew Point Transmitter

- Measurement ranges -60...+30 °C (-76...+86 °F) Td with ±2 °C (±3.6 °F) accuracy
- Auto-calibration
- LED alarm
- Single output



DMT152 Dew Point Transmitter

- Measurement range -80...-20 °C (-112... -4 °F) Td with ±2 °C (±3.6 °F) accuracy
- Auto-calibration
- LED alarm
- Dual output

Portable Instruments for Spot Checking

In both production areas and plant compressed air lines, environmental conditions should be checked periodically to verify and maintain the performance of dew point transmitters. Portable instruments can be used as a field transfer standard to verify a dryer system is operating within specification limits.

The HM40 portable humidity meter can be used to verify moisture levels inside material storage bins and cabinets.



DM70 Hand-Held Dew Point Meter for Spot-Checking

- Measurement ranges from -60 to +60 °C (-76 ... +140 °F) Td
- Auto-calibration function
- Sensor withstands condensation
- Traceable calibration
- Fast response



HM40 Hand-held Humidity & Temperature Meter Series

- Humidity measurement range 0 ... 100 %RH
- Temperature measurement ranges -40 ... +100 °C (-40 ... +212 °F), depending on probe model
- Graphical display indicates when measurement stabilized
- Traceable calibration

Material Storage and Production Environment

It is often recommended to monitor and/or control the rooms where manufacturing equipment is used, and areas where filament materials or sintered metal materials are stored.



HMW80 Series Humidity & Temperature Transmitter

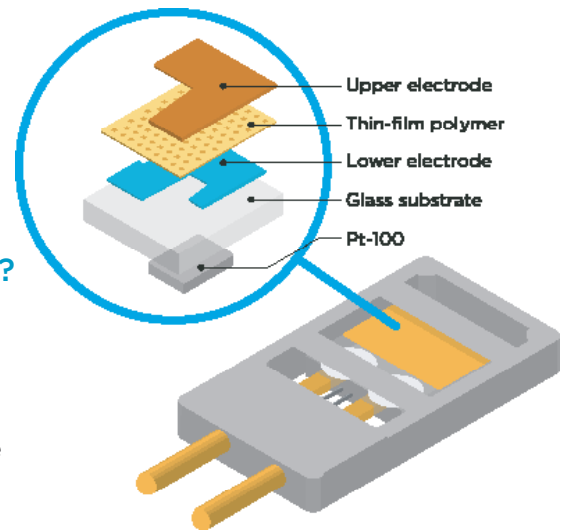
- +3% RH and +0.5 °C (+0.9 °F) accuracy
- mA or Vdc outputs
- No calibration required
- User replaceable INTERCAP® RH sensor for easy maintenance



HMW90 Series Humidity & Temperature Transmitter

- +1.7% RH and +0.2 °C (+0.36 °F) accuracy
- mA or Vdc outputs
- Traceable Calibration certificate included
- Field calibrateable

Vaisala DRYCAP® Sensor for Measuring Dew Point in Additive Manufacturing



What's the difference between Humidity vs. Dewpoint?

Relative humidity and dew point both relate to the amount of water vapor in the air.

Dew point is the temperature at which the air becomes saturated (100% relative humidity). It is dependent on the amount of moisture in the air and pressure.

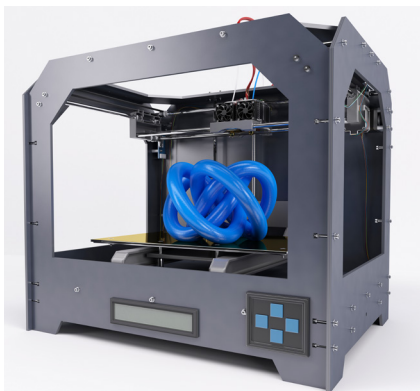
Relative humidity is the percent of saturation at a given temperature, or how close it is to 100% saturation at a specific temperature. It depends on moisture content and temperature. Warmer air has the ability to hold more water vapor. If air is at 100% relative humidity at 60 °F, but is heated to 93 °F, its relative humidity decreases to about 33%. Its dew point remains at 60 °F.

Vaisala's DRYCAP® auto-calibration feature

Vaisala's DRYCAP® sensor incorporates an auto-calibration feature, invented by Vaisala, to measure accurate dew point. When relative humidity approaches zero, rather small changes in humidity will result in quite large changes in dew point readings. For example, dew points of -40 °C and -50 °C at room temperature correspond to relative humidities of 0.8% RH and 0.3% RH, respectively.

During auto-calibration, the sensor is heated and allowed to cool. During this cycle, the humidity and temperature readings of the sensor are monitored and plotted. This data is analyzed and used to adjust the reading of the humidity sensor.

Vaisala's DRYCAP® sensor also recovers from water spikes or condensation. With auto-calibration functionality, it reacts immediately when it senses a decrease in dew point of 10 °C or more by initiating a sensor purge cycle that applies heat to the sensor. This expels water molecules from the polymer layer, drying the sensor, and providing a stabilized reading within 5-6 minutes.



DRYCAP's Unique Benefits

- Excellent long-term stability, with recommended 2-year calibration interval
- Rapid response time
- Withstands condensation and recovers rapidly
- Resistant to particulate contamination, oil vapor, and most chemicals

DRYCAP® In Brief

- Thin-film polymer sensor with unique auto-calibration function
- Wide measurement range; dew point measurement down to -80 °C (-112 °F)
- Accuracy ± 2 °C (± 3.6 °F)
- Traceable calibration certificate included

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