



# Monitoring of Desiccant Wheel Dryers for Controlled Environments

Application Notes



Semi-conductor Clean Rooms

## Background

Many manufacturing processes and operations require closely controlled dry conditions - for example semiconductor manufacture, nuclear power industry, battery manufacture, cold storage facilities and pharmaceutical production.

To provide the right working conditions in dry rooms and clean rooms the air supply is firstly dried by desiccant wheel dryers. Because a variance in the moisture content of the air could be critical to the application it is important to control the temperature required for regeneration of the desiccant by measuring the generated dew point.

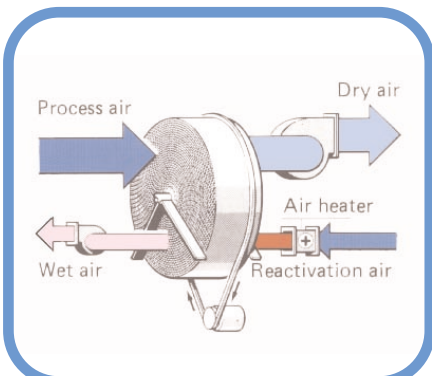
Sorption is the adsorption or the absorption process by which desiccant removes water vapour directly from the air. When the air to be dried passes through the rotor, the desiccant removes the water vapour directly from the air and holds it while the wheel rotates.

## Reference Users

AEA, Atlas Copco, Dowty Ultralife Batteries, Eternacell, Marconi Electronic Devices, Munters, SGS Thompson

## Pharmaceutical Production

Dry air is required at very low dew points,  $-40\text{ }^{\circ}\text{C}$  typically, for basic compounds when dried in a fluid air bed system. The intention is to stop moisture regain while cooling the material prior to packaging. In all cases it is essential to have close control, repeatable conditions and traceability. The solution would be to use Cermet II, Optidew or S4000 Integrale (depending upon accuracy required) which all offer conversion for accurate rh measurements. Close control on the dehumidifier would be achieved by modulation of dry air.



Munters' principle desiccant wheel dryer

## Battery Production

"Hot/Lithium batteries" have developed over the last 20 years in terms of both the manufacturing requirements and the material used. In current installations room control conditions are typically  $-35\text{ }^{\circ}\text{C}$  to  $-40\text{ }^{\circ}\text{C}$  dew point with numerous people working on battery manufacturing. The moisture emissions from the personnel have to be removed by dry air being continuously and accurately delivered to facility at  $-50\text{ }^{\circ}\text{C}$  to  $-60\text{ }^{\circ}\text{C}$  dew point. Either Optidew or the S4000 Integrale could be used on return from the room to modulate the reactivation energy on the desiccant dehumidifier.

## Measurement Technique

Depending on the accuracy required, the appropriate on-line measurement system can be chosen - Cermet II giving  $\pm 1\text{ }^{\circ}\text{C}$  dew point accuracy, Optidew/S4000 giving  $\pm 0.1$  to  $0.2\text{ }^{\circ}\text{C}$  dew point accuracy. Sensors are strategically positioned within the room to ensure optimum conditions are maintained at all times.



S4000 Integrale

Michell Instruments Ltd  
48 Lancaster Way Business Park,  
Ely, Cambs, CB6 3NW, UK  
Tel: +44 (0)1353 658000 Fax: +44 (0)1353 658199  
e-mail: info@michell.co.uk  
www.michell-instruments.com



The Dew Point Specialists



Q6284 (UK)



0179 (UK)





Coated tablets

## Coating Processes

### Background

The coating process is widely used in the pharmaceutical and confectionery industries for coating tablets, pills and sweets for easier swallowing and to prevent dehydration of soft centres. It is important, therefore, to control the humidity during the spray coating process to ensure the tablets and sweets have a smooth, aesthetic outer coating. An added advantage of monitoring the process is that drying time is allowed to be kept to a minimum.

### Reference Users

Boots Pharmaceuticals, Dandy Stimerol Chewing Gum, Glaxo SmithKline, Nestlé, Rowntree Macintosh, Trebor Bassett

