

Moisture Control in Lithium Batteries

The most important factor governing the manufacturing of Lithium-ion batteries is the fact that they must be produced in a Dry Room with very stringent humidity conditions as low as 1% to 10% RH.

Lithium battery applications is fast growing across diversified industries like Electronics, Automotive, Solar, Telecom, Power, Defence, Healthcare etc. There is large scale production of Lithium battery and moisture acts as a major deterrent leading to the growth of this industry.

Effects of Uncontrolled Humidity

Lithium batteries are affected by uncontrolled temperature and humidity. If the Lithium battery is exposed to moisture during production, it may lead to impairing quality, thus:

- Reduced product life
- Reduced performance (charging capacity)
- Raise safety concerns including chances of explosion



Cause

Pure Lithium metal is extremely sensitive to even tiny amounts of moisture in the air. Hence, slightest of exposure to moisture leads to reduced performance and reduced product life of Lithium-ion batteries.

General Recommendations

- Moisture level in Lithium-ion battery processing areas should have less than (-) 35 °C dew-point and/or moisture content of 0.14 grams per kg of dry air
- Room temperature should be maintained at recommended levels, around 25 °C, with tolerance of +/- 2 °C along with dew points in the range of (-) 35 °C to (-) 45 °C. (0.14 to 0.04g/kg).
- The air change rate in the production room should be more than 50 air changes per hour with maintenance of minimum fresh air introduction for positive room pressure and ventilation for workers

Bry-Air Solution

High technology often entails working in precisely controlled environmental conditions. Lithium batteries are a classic example of a product where production is not possible in the absence of efficient dehumidification. Dehumidification, or moisture control, has proven itself to be a critical factor in the control of the environment in the dry rooms without which lithium battery manufacturing is not feasible.

Bry-Air's DryPurge® (DP) patented technology for dehumidifiers ensures optimum performance of dehumidifiers, even at the ultra low dew point, up to (-) 90 °C. Bry-Air is the only total solution provider for Dry Rooms with Environment Control Equipment incorporating Patented Technology critical for Lithium Battery Manufacturing.

Partial Reference List

- | | |
|----------------------------|--|
| • Schlumberger | • Bamo Battery |
| • Mercedes | • Pulead Technology Industry Company Ltd. |
| • BYD | • Indian Institute of Technology, Kharagpur |
| • Wuhan Design Institute | • Defence Research & Development Laboratory |
| • Beijing University | • Naval Science and Technological Laboratory |
| • Guizhou Mei Ling Li Batt | • E-One Moli Energy |