

# Semiconductor Industrial

Moisture absorption and retention inside electronic packages cause numerous problems. Trapped moisture can vaporize and exert internal package stresses when the device is subjected to sudden, elevated temperature, such as during reflow. Moisture induced package cracking, die pad surface peeling and micro-cracking which extend to external package cracking.

Semiconductor ICs (integrated circuits) that have been exposed to moisture can become extremely weak, causing them to break during mounting onto printed circuit boards. Many electronics products can withstand a relative humidity of only 10 to 15 percent or less to ensure product stability and extended shelf life. A next-generation organic light emitting diode (OLED) display, for example, would last only a few minutes if not properly protected from moisture.

## Frequently Faced Problems

Humidity / Moisture causes corrosion of 'Circuit Points', condensation on microchips circuit surface and improper adhesion of photoresists causing operational failure of Semiconductor Assembly.

## General Recommendation :

Relative Humidity in semiconductors product's packaging should be maintained at RH 30% & Temp 20°C

## Our Solution :

Semiconductors - Microcircuits and Microchips - manufacturing requires very precise condition to be maintained in the manufacturing/ processing area. Components used in assembly / transit period are generally hygroscopic and thus highly susceptible to high humidity conditions.

A high Humidity condition causes operational failure of chips, improper adhesion, corrosion in circuit points and many other problems.

## Humidity Control.... An important variable to -

- Prevent corrosion of 'Circuit Points'.
- Prevent condensation on microchips circuit surface.
- Protect equipment
- Better adhesion of photoresists



## Thus Humidity Control Becomes A Must In

### 1. Storage Area

In the storage of semiconductors and integrated circuits, the permeability of moisture go in the packaging will effects the increases defects. Photosensitive polymer compounds called photoresists are used to mask circuit lines for etching process. Due to their hygroscopic nature they absorb moisture resulting in the microscopic circuit lines being cut or bridged, leading to circuit failure.

### 2. Protection of Transit

Cargo Sweat - Occurs when the skin of the container is cooled to a temperature below that of the dew point of the air enclosed within the container. This results in water droplets forming on the interior roof and side panels, and then dripping down on the cargo causing mold and water damage. Cargoes that spontaneously heat from within can increase the problem.

Occurs when the surface of the cargo is cooler than the dew point of the air enclosed within the container. Droplets of water then form on the surface of the cargo. An example is: - A cargo of canned goods is loaded in cold winter conditions in Europe and transported to the tropical belt. The container will gradually heat up during transit to the

warmer moist climate however the cargo temperature will lag behind, slowly heating up and replacing the cold from loading.

If ventilation was allowed to take place the warm moist air from outside the container would condense on the cold cargo. In this case it is better to avoid ventilation during transit and allow the cargo temperature to gradually increase thereby restoring equilibrium between the cargo temperature and the outside air.

Desiccant are intended to protect the package contents from humidity during transport and storage in order to prevent corrosion, mold growth and the like. Prolonged exposure to moisture can reduce product quality. Water vapor is one of the world's most damaging contaminants.