

## MSL3 Moisture Sensitivity IC Handling Guidelines

### Abstract

This Application Note provides PCBA manufacturing customers with guidelines for handling Active-Semi products with MSL3 packages.

### Affected Packages and Devices

Active-Semi follows JEDEC standards for moisture classifications. The following Active-Semi packages are classified as MSL3:

Package	MSL
FCQFN44-20	3
FCQFN44-32	3
FCQFN55-28	3
FCQFN55-40	3
MSOP-8	3
QFN88-51	3
SOP-8	3
SOP-8/PP	3
TQFN1010-57	3
TQFN44-20	3
TQFN44-24	3
TQFN44-32	3
TQFN55-40	3
TQFN66-48	3
TQFN88-43	3
TQFN88-56	3

### Handling MSL3 products at PCBA

#### Shelf life:

A product's shelf life is defined as the amount of time from when the product was manufactured to the time the device can be left in storage without being used.

Active-Semi's standard shelf life for packaged products is five years, with vacuum packing and stored in the environment condition of ≤30°C/60%(RH), from the time it was manufactured to the time it is delivered by Active-Semi or an Active-Semi authorized distributor.

#### Product Receiving

All Active-Semi MSL3 products are baked before dry packing at 125°C/12 hours.

When receiving the products, customers should check the carton box for deformation or vacuum leakage.

In case of any vacuum leakage, or HIC (Humidity Indicator Card) discoloration, the customer must re-bake the products at 125°C/12 hours.

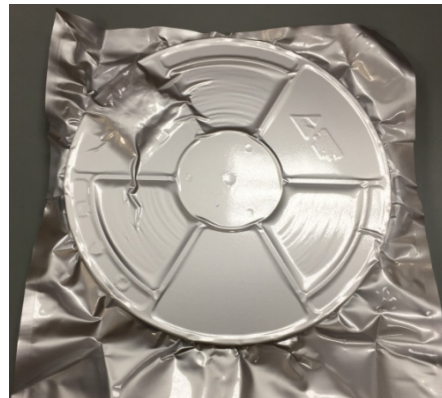
Below are photos for the examples of label, typical vacuum packing, HIC and leakage.



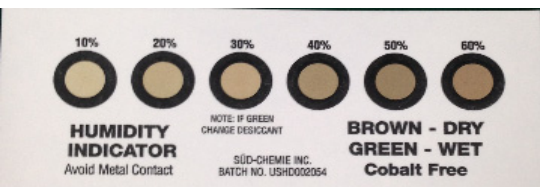
MSL level definition on label.



Vacuum pack for trays.



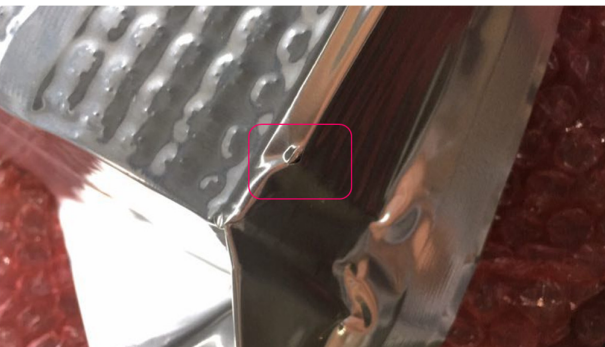
Vacuum pack for reel



Cobalt-Free HIC.



Desiccant



Typical vacuum leakage with pierced through MBB.

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## Handling during PCB Assembly

### Floor Life:

Floor life of a product is defined as the allowable amount of time between removing moisture-sensitive devices from a moisture-barrier bag (MBB) and the soldering process.

Active-Semi MSL3 products follow the JEDEC MSL3 168 hours floor Life (out of bag) guidelines at ambient  $\leq 30^{\circ}\text{C}/60\% \text{RH}$ .

### Handling after opening MBB

According to JEDEC, For Short Duration Exposure the floor-life clock can be stopped/paused by placing the part in a dry cabinet that maintains relative humidity  $< 10\% \text{RH}$ .

However, the dry cabinet is an unstable environment, may have frequently open/close. It is **NOT** recommended to be used as a **long-term** storage method in place of proper dry packing. If the parts are not expected to be used within 168 hours, we suggest to rebake and repack the products in MBB with new desiccant and HIC.

If the devices are exposed to greater than  $30^{\circ}\text{C}/60\%(\text{RH})$  **for any length of time**, the customer must re-bake the ICs at  $125^{\circ}\text{C}/12$  hours prior to dry packing them again.

Since high temperature baking accelerates the product lifetime, Active-Semi does not suggest that customers rebake the products  $> 2$  times.