

Policy, Process, & Procedure

# Handling, packaging, and shipping of moisture sensitive components

This is the official guide of how 1-Source Electronic Components, Inc., ensures properly processing moisture sensitive parts that have been classified to the levels defined in J-STD-020. The processes mentioned within will help to avoid damage from both temperature and excessive humidity levels.

The Moisture Sensitivity Level or MSL is the most critical component as it reflects the amount of time a moisture sensitive device can be exposed to normal or ambient room conditions. Generally this is considered to be 30 degrees Celsius and a relative humidity of 60%

IPC/JEDEC has established a standard classification system for MSL levels. See IPC/JEDEC J-STD-20 MSL Classifications chart below.

**IPC/JEDEC J-STD-20 MSL Classifications**

Level	Floor Life		Soak Requirements			
	Time	Cond degC/%RH	Standard Time (hrs)	Standard Cond degC/%RH	Accelerated Time (hrs)	Accelerated Cond degC/%RH
1	unlimited	<=30/85%	168+5/-0	85/85	n/a	n/a
2	1 year	<=30/60%	168+5/-0	85/60	n/a	n/a
2a	4 weeks	<=30/60%	696+5/-0	30/60	120+1/-0	60/60
3	168 hours	<=30/60%	192+5/-0	30/60	40+1/-0	60/60
4	72 hours	<=30/60%	96+2/-0	30/60	20+0.5/-0	60/60
5	48 hours	<=30/60%	72+2/-0	30/60	15+0.5/-0	60/60
5a	24 hours	<=30/60%	48+2/-0	30/60	10+0.5/-0	60/60
6	TOL	<=30/60%	TOL	30/60	n/a	60/60

As an example MSL level 4 indicates a component can be kept unpacked for 72 hours at standard room conditions. Knowing the MSL level for in house components is critical in that it gives us a timeframe to safely dry pack goods from the moment they are opened for inspection.

How to ascertain whether a component has an MSL 1 or MSL 6 can be difficult as many parts arriving in house aren't in original manufacturers packaging with clear MSL indication levels. When this info is easily obtainable then standard manufacturer requirements are followed. If this info isn't available or can't be found by

searching the manufacturers’ website then we will default to the highest MSL level and consider these parts to be the highest sensitivity levels.

Components will be processed immediately in proper MSL level packaging whether they are shipping same day or are part of a scheduled order. No component should be exposed for more than 24 hours once opened. 1-Source doesn’t possess the capability to “bake” goods once they have been exposed to room conditions. This places greater emphasis on proper dry packing procedures.

It is important to handle dry pack bags very carefully in order to prevent plastic packages and components from absorbing moisture. Dry packing requirements for the various moisture sensitive levels as determined by J-STD-020 are shown below.

### IPC/JEDEC J-STD-20 MSL Dry Packing Requirements

Level	Dry Before Bag	MBB	Desiccant	MSID*Label	Caution Label
1	Optional	Optional	Optional	Not Required	Not Required if classified at 220 225°C Required if classified at other than 220 225
2	Optional	Required	Required	Required	Required
2a- 5a	Required	Required	Required	Required	Required
6	Optional	Optional	Optional	Required	Required

All of the packaging that 1-Source uses is fully compliant with all standard requirements in MIL-PRF-81705D, MIL-I-18835 and Military Specification D-3464D.

A proper packed component will contain a moisture barrier bag, humidity indicator card, desiccant, dry pack label and marking of the MSL of the component.

Once MSL possible parts arrive in our facility the packaging should be inspected, making sure they are fully sealed and have no punctures or tears. Once the moisture barrier bag has been opened and the parts inspected they should then be sealed within 1 hour after opening ensuring that the total exposure time doesn’t exceed the recommended MSL time.

Each moisture barrier bag will be vacuum sealed prior to shipping and will contain desiccant, humidity indicator card and dry pack identification label. Proper care will be taken when sealing so as not to puncture or tear the moisture barrier bag.

1-Source has identified the following package types as potential moisture sensitive devices but doesn’t consider this list to be all inclusive. LQFP, OBGA, PBGA, PLCC, PQFP, SOIC, SSOP, TQFP, QFN, WLP. These parts

are generally more susceptible to potential issues due to the material they are made from and the general thinness of the parts.

In closing, 1-Source makes it a vital point to identify any potential issues that may arise with components and package them in a secure, safe, and moisture-free environment which will ensure the best possible parts for our valued customers.

### Definitions

MSID Label - Moisture Sensitive Identification Labels relevant to the dry pack process. See JEDEC JEP113 and Figure 1 below. The MSID label shall be affixed to the out-side surface of the Moisture Barrier Bag and to the lowest level shipping container to indicate that moisture-sensitive parts are in the container. The label is commercially available and recommended to be a minimum of ¾ inch (19 millimeters) in diameter.



Figure 1 - Example image of MSID