

Frequently Asked Questions About Dry Cabinets & Dry Storage

Our customers often approach us with questions about our technologies. To make life easier for you, we've included a list of frequently asked questions below. However, if you cannot find the answer to your questions here, please do not hesitate to [contact our team](#).

What is a Dry Cabinet?

In short, a [dry cabinet](#) is a storage device that allows you to protect a wide range of products against humidity problems. A Desiccant Dry Cabinet is an enclosure with a supply of desiccant which maintains an internal environment of 1-50% RH. Desiccant dry cabinets are also called: desiccators, dry boxes, dehumidifying cabinets, and ultra low humidity storage cabinets.

What should be stored in a Dry Cabinet?

Any component classified as an MSD (Moisture sensitive device), particularly devices classified as level 4-5a. These devices are most susceptible to moisture

related defects. Desiccant dry cabinets can also be used to store partially populated double sided boards. While waiting to re-enter production to complete 2nd side assembly, components begin to absorb moisture that could do harm once the PCB is introduced back to the reflow oven.

The recommended RH for different products is as below:

45-55%RH : Magnetic Diskettes, Magnetic Tapes, Cameras, Lenses, Video Camcorders, CDs, Projector Slides, Telescopes, Photographs, Photo negatives, Paintings etc.

35~45%RH : Sensitive Electronic Instruments, Electronic Devices, Measuring Devices, Semiconductors, Batteries, Sensors.

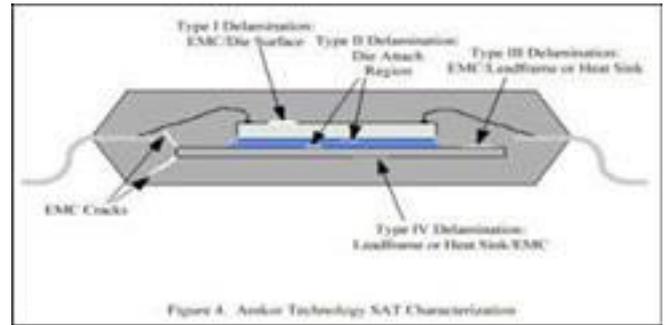
Below 35%RH : Medicine Samples, Seeds, Pollen, Spices, Tea, Coffee, Dried Food Products

Below 5%RH : Ics, Sensitive Electronic Components, Components That Require Floor Life Reset.

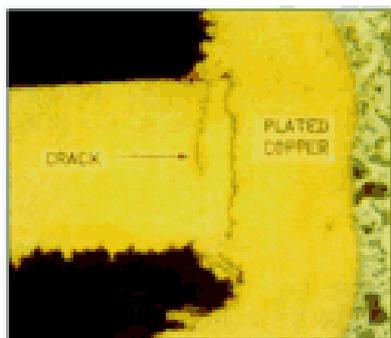
What are the defects that I could experience related to moisture contamination of MSDs?



Bond damage, Wire necking



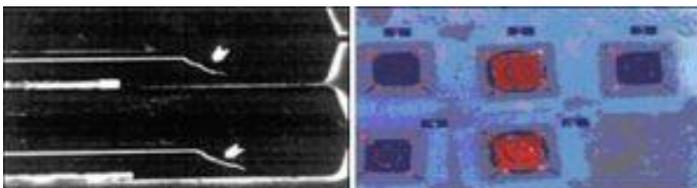
Bond lifting, Die lifting



Thin film cracking, cratering beneath the bonds



Corrosion due to ionic contaminants, popcorning



Increase in thermal resistance due to delamination: Cracks & Paddle delamination

How can I tell if I have MSD-related defects occurring on my floor?

Initially you may not see any signs of some of the defects listed above. Other defects such as cracking may be visible to the eye, and 'popcorning' may actually be heard coming from inside your oven in severe cases. Still, it's very difficult to detect these defects, even standard ICT may show no abnormalities. If you are interested in determining whether your process may be susceptible to moisture-related damage you could run the following test:

Allow a tray of MSDs to flow through your process as they normally would while being assembled (including all dwell times and reflow). At the end of the process send the MSDs to an independent lab for scanning acoustic microscopy, or cross-sectioning. If defects are

evident in the results then you can be sure that you would realise savings and reliability with the implementation of an MSD control program.

Will storing my components in a Totech Super Dry cabinet satisfy IPC JEDEC J-STD 033?

No is the short answer, arbitrarily storing your MSDs in any desiccant cabinet, dry box, N2 (Nitrogen) cabinet, hot air box, or any other dehumidification device will not on its own satisfy IPC J-STD-033. It will not automatically 'Stop the clock' However, the implementation and correct use (calculated storage duration based upon floor exposure, etc) of a desiccant dry cabinet capable of maintaining less than 5% RH (such as a Totech Super Dry), is a crucial part of a strong MSD control program.

What is desiccant and how does it work?

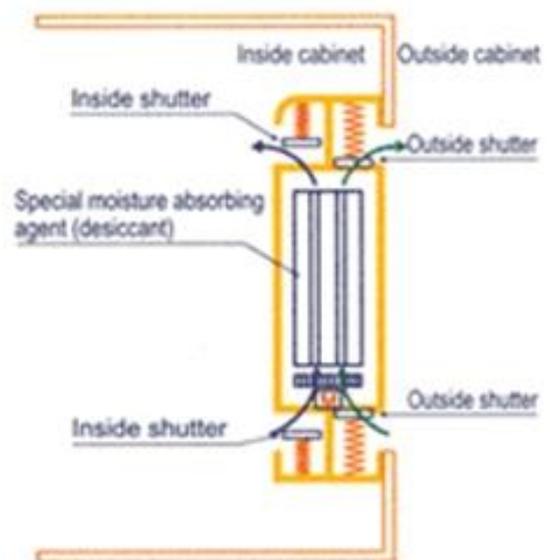
Desiccant is defined as; "A substance that has a high affinity for water and is used as a drying agent "- from Latin dsiccns. It is a generic term for a variety of materials, some names that you may be familiar with include: Montmorillonite Clay, Silica Gel, Indicating Silica Gel, Molecular Sieve, Calcium Oxide, Calcium Sulphate, and Zeolite. High quality desiccants have an ability to be recycled or refreshed easily and effectively, bringing them back to full strength.

How do Super Dry Totech desiccant dryers function?

Our newly developed, dynamic high performance drying unit U-5002, achieves air moisture levels of under 0.17% RH, even at temperatures of 60°C. Unlike traditional technology, during cabinet door openings, air moisture levels barely rise above 5% and sink within a few minutes again to

In manufacturing environments, the regeneration behavior of the drying unit adapts itself dynamically to the needs of short opening cycles of the doors and multi-layer loading.

Through this, the availability and efficiency is improved considerably in comparison to a fixed regeneration cycle.

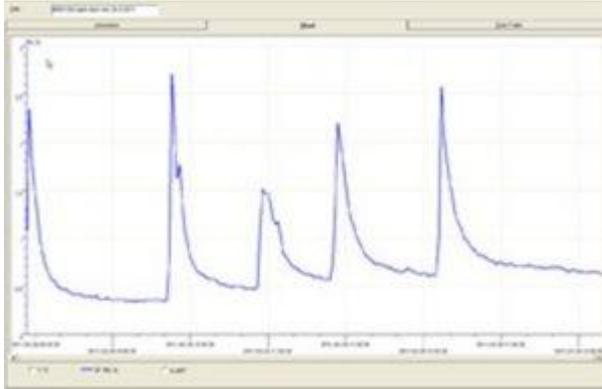


What is Recovery time?

This may be the single most important cabinet performance parameter, though Minimum RH level is the most frequently cited. Recovery time refers to the time required for the cabinet to reduce the RH level back to its set point after the door has been opened and closed. The latest Super Dry cabinets employ the newly developed U5002 dry unit which is measurably more powerful than any other technology. The graph below demonstrates how the MSD 1222 modular cabinet recovers following 4 door openings of 30 seconds. In addition this "Dynamic Dry Unit" is closed loop responsive to changes in demand and will

regenerate at the frequency required to maintain the set point. Superior stability AND energy utilization.

Measure your cabinet under similar conditions!



[Do Super Dry cabinets require nitrogen?](#)

Totech Super Dry desiccant dry storage products do not require nitrogen to maintain the RH levels indicated within the specifications.

[What are the benefits of dry cabinets over moisture barrier bags \(MBBs\)?](#)

Saves labour; trays and reels can be placed directly into the cabinet without having to be placed into MBB (moisture barrier bags)

Saves cost; Less desiccant (i.e. indicating silica gel), and MBB's required.

More secure; no need to be concerned with; Calculations to determine the correct amount of desiccant, the quality and remaining absorbency of the desiccant, and potential mis-sealing, or possibility of punctures of the bags themselves.

[What are the benefits of dry cabinets over baking?](#)

Less costly than baking; with a monthly power consumption of only 40.4 kW it's considerably less expensive than long duration bake cycles.

More efficient; Components are being dehumidified while they sit in inventory, always ready for the next run.

More convenient; Operators will be more inclined to place components into cabinets rather than taking the time to re-bag, especially for short duration exposures.

Space saving; smaller outside dimensions than that of comparable burn in cabinets as a result of insulation, wiring, etc.

Better Quality; Baking SMD packages may cause oxidation or intermetallic growths to form, which can reduce solderability. Component carriers may cause outgassing during baking, again, effecting the solderability.

Less Concern; Standards suggest when baking between 90-125 deg C. a max time of 48 hours be observed, then deviations should be requested. With desiccant cabinet storage there is no maximum to observe.

Less handling; there is no need to transfer components from their standard packaging to high temp carriers in preparation for the bake, possibly introducing physical damage to the component itself.

Are Totech Super Dry cabinets ESD-safe?

All Super Dry cabinets are ESD safe. Standard features include; Stainless steel shelves, conductive glass, conductive paint on all cabinet surfaces, and 1MΩ earth lead.

What happens to my Super Dry Totech cabinet if the power goes off?

Totech Super Dry cabinets are designed and manufactured to be able to maintain an environment of less than 5% RH for a period of 10 days, and less than 10% RH for a period of approximately 20 days if the cabinets remain closed and no new moisture is introduced.

Does the number of doors represent the number of storage areas in a Super Dry Totech Cabinet?

No, there are a variety of models, with a variety of door configurations. The interior of the cabinet is one environment. There is benefit however from a higher number of doors; there is less of an exchange of atmosphere when a smaller door is opened and closed.

Can I change the configuration of the Super Dry Totech cabinet interior?

We offer a selection of options to choose from that will make our cabinets more suitable to your particular application; additional shelves, reel rack (for taped SMDs), dividers, and slide out shelves, to name a few.

Can I monitor my Super Dry Totech cabinets over a network?

All [MSD](#), [HSD](#), [XSD](#) and [SD Plus](#) models have built in Ethernet connections which enable network monitoring. With other models, the optional and retrofit-able SDDL Data Logger will enable a network connection.

Does the desiccant require replacing?

No, the desiccant is extremely well suited to the task and should perform well under normal operating conditions for 10 years or more without replacement.

Do Super Dry Totech cabinets require any maintenance?

No required maintenance whatsoever.

Where can I get replacement parts and service for my Super Dry Totech Cabinet?

Totech will be happy to respond to all of your service and spares requirements. [Simply contact our team today.](#)