

# 3M™ Desiccant

## Calculating Desiccant Loading

### What is Desiccant?

Desiccant is a drying agent that is used to absorb moisture from the air inside moisture barrier bags. Desiccant absorbs moisture vapor (humidity) from the air left inside the barrier bag after it has been sealed. Moisture that penetrates the bag will also be absorbed. Desiccant remains dry to the touch even when it is fully saturated with moisture vapor.

### How much Desiccant do I need?

Desiccant is sold by the "Unit" or fractional Unit, or in grams. One unit of desiccant will absorb a specific amount of moisture. A unit weighs about 33 grams. There are several standards for calculating the desiccant loading for bags. Each standard is for a specific application, and requires different amounts of desiccant for the same bag size. You must determine which standard most closely matches your particular application, if any, and apply the appropriate formula, or ask your 3M representative for our spreadsheet Desiccant Calculator.

### Why are electronic devices moisture sensitive?

Certain kinds of electronic devices called "Surface Mount Devices" or SMD's are mounted on a circuit card by high temperature soldering. The body of the SMD is made from plastic that absorbs moisture from the air. When the case is heated during soldering, the moisture inside turns to steam, and may break the device as the steam escapes. Keeping SMD's dry before soldering helps prevent the devices from being damaged.

#### IPC/JEDEC J-STD-033

**Application:**

Dry packaging for SMD's.

**What You Need Know:**

Bag Size, Bag MVTR, Storage Time in Months.

**Formula:**

$$\text{Units} = \frac{0.304 \times \text{Months} \times \text{Bag MVTR} \times \text{Bag Area}}{\text{Moisture Capacity}}$$

**Example:**

8" x 10" inch Barrier Bag, with a 0.002 MVTR and a 12 month storage time.

**Find Bag Area:**

8" x 10" x 2 sides =160 sqin.

**Apply Formula:**

$$\text{Units} = \frac{0.304 \times 160 \text{ sqin} \times 0.002 \text{ MVTR} \times 12 \text{ months}}{6.6667 \text{ g/unit}}$$

Units = .2 Use 1/6 unit of Desiccant.

#### EIA 583

**Application:**

Dry packaging for SMD's. Allows adjustment of environmental conditions.

**What You Need Know:**

Bag Area, Bag MVTR, Months of Storage, Maximum Interior Humidity (MIH).

**Formula:**

$$\text{Units} = \frac{0.231 \times \text{Bag Area} \times \text{Bag MVTR} \times \text{Months}}{\text{Moisture Capacity}}$$

**Example:**

8" x 10" inch Barrier Bag, with a 0.02 MVTR, a 12 month storage time, and a MIH of 20%.

**Find Bag Area:**

8" x 10" x 2 sides =160 sqin.

**Select Moisture Capacity based on MIH:**

10% MIH: 3.0 g/unit 20% MIH 4.8 g/unit 30% MIH 5.8 g/unit 40% MIH 6.2 g/unit

**Apply Formula:**

$$\text{Units} = \frac{0.231 \times 160 \text{ sqin} \times 0.02 \text{ MVTR} \times 12 \text{ months}}{4.8 \text{ g/unit}}$$

Units = 1.8 units Use 2 units of desiccant.

#### MIL-P-116

**Application:**

General dry packaging.

**What You Need Know:**

Bag Size

**Formula:**

$$\text{Units} = 0.011 \times \text{Bag Area in square inches.}$$

**Example:**

8" x 10" inch Barrier Bag

**Find Bag Area:**

8" x 10" x 2 sides =160 sqin.

**Apply Formula:**

$$\text{Units} = 0.011 \times 160 \text{ sqin} = 1.8$$

Use 2 Units of desiccant.

P R O D U C T D A T A S H E E T

## Desiccant in Plastic or Kraft Paper Pouch

Distributed by:

**All-Spec Industries**

5228 US Hwy 421 N  
Wilmington, NC 28401

[www.all-spec.com](http://www.all-spec.com)  
[sales@all-spec.com](mailto:sales@all-spec.com)

PH: 800-537-0351  
FX: 800-379-9903



**PRODUCT**  
DESICCANT, PLASTIC OR KRAFT POUCH

**ITEM NUMBER**  
SEE PAGE 1

**DATASHEET**  
1110-H

# 3M™ Desiccant

Desiccant Loading on Page 2

## Plastic or Kraft Paper Pouch

This efficient desiccant begins its work by absorbing air borne moisture left inside the bag when you've finished vacuum packaging. Then it captures moisture that manages to pass through the bag material. Secured in a strong envelope of either clean room compatible, sulphur-free non-woven Plastic or economical Kraft Paper, desiccant helps keep your devices dry, even through unexpected shipping delays or longer than anticipated storage time.

## Specifications

### Typical Values

Pouch: Kraft paper or non-woven plastic  
 Print: Blue ink  
 Unit sizes: 1/6, 1/3, 1/2, 1, 2, 4, 8, 16  
 Media: montmorillonite clay  
 Form: Free flowing even when fully saturated.  
 Packaging: Air tight pails or drums



## Plastic Pouch

(Plastic)



Pouch Size	Part Number	Pouches per Container	Container Weight (pounds)	Pouch Size			
				Width (in)	Length (in)	Width (mm)	Length (mm)
1/6 Unit	1/6PLDES1200	1200	20	2.125	2.125	54	54
1/3 Unit	1/3PLDES700	700	22	2.125	2.50	54	64
1/2 Unit	1/2PLDES550	550	25	2.125	2.875	54	73
1 Unit	1PLDES300	300	28	3.00	4.50	76	114
1 Unit	1PLDES1300	1800	157	3.00	4.50	76	114
2 Unit	2PLDES150	150	32	5.00	4.50	127	114
2 Unit	2PLDES800	800	135	5.00	4.50	127	114
4 Unit	4PLDES500	500	156	5.00	6.250	127	159
8 Unit	8PLDES300	300	194	4.50	8.50	114	216
16 Unit	16PLDES150	150	184	4.50	11.00	114	279

## Kraft Pouch

(Paper)



Pouch Size	Part Number	Pouches per Container	Container Weight (pounds)	Pouch Size			
				Width (in)	Length (in)	Width (mm)	Length (mm)
1/6 Unit	1/6KDES1200	1200	20	2.375	2.75	57	70
1/3 Unit	1/3KDES700	700	22	2.375	3.125	60	79
1/2 Unit	1/2KDES550	550	24	2.375	3.50	60	89
1 Unit	1KDES300	300	27	3.00	4.50	76	114
1 Unit	1KDES1300	1300	128	3.00	4.50	76	114
2 Unit	2KDES150	150	32	5.00	4.50	127	114
2 Unit	2KDES800	800	150	5.00	4.50	127	114
4 Unit	4KDES500	500	156	5.00	6.250	127	159
8 Unit	8KDES300	300	200	4.25	8.50	108	216
16 Unit	16KDES150	150	184	4.50	10.60	114	269

### Important Notice

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