# FDRA Trade, Logistics, & Customs Meeting FOR MEMBERS

## October 13, 2022
## BOSTON

Critical updates for trade, customs, supply chain, and compliance executives and professionals

SUPER DRY
SUPERIOR DESICCANT

FDRA
FOOTWEAR DISTRIBUTORS AND RETAILERS OF AMERICA

# Moisture & Mold Damage Prevention, or The Curse of the Container

1. Why desiccant is necessary?
2. Product Categories
3. Usage Principles

# HOT AIR!! - or - Why we need desiccants

| Temperature | | Max. Water Content | |
|---|---|---|---|
| (℃) | (°F) | ($g/m^3$) | ($10^{-3}$ $lb/ft^3$) |
| 60 | 140 | 130.0 | 8.10 |
| 50 | 122 | 83.0 | 5.20 |
| 40 | 104 | 51.10 | 3.20 |
| 30 | 86 | 30.40 | 1.90 |
| 20 | 68 | 17.30 | 1.07 |
| 10 | 50 | 9.39 | 0.59 |
| 0 | 32 | 4.89 | 0.31 |
| -10 | 14 | 2.31 | 0.14 |
| -20 | -4 | 1.05 | 0.066 |

(Water Holding Capacity of Air)

Example: Free Moisture Released due to Temperature Variation:

**Temperature in closed Container after loading: 50 ℃/122F**

**Water content in air at 95% humidity: 80grams/cbm**

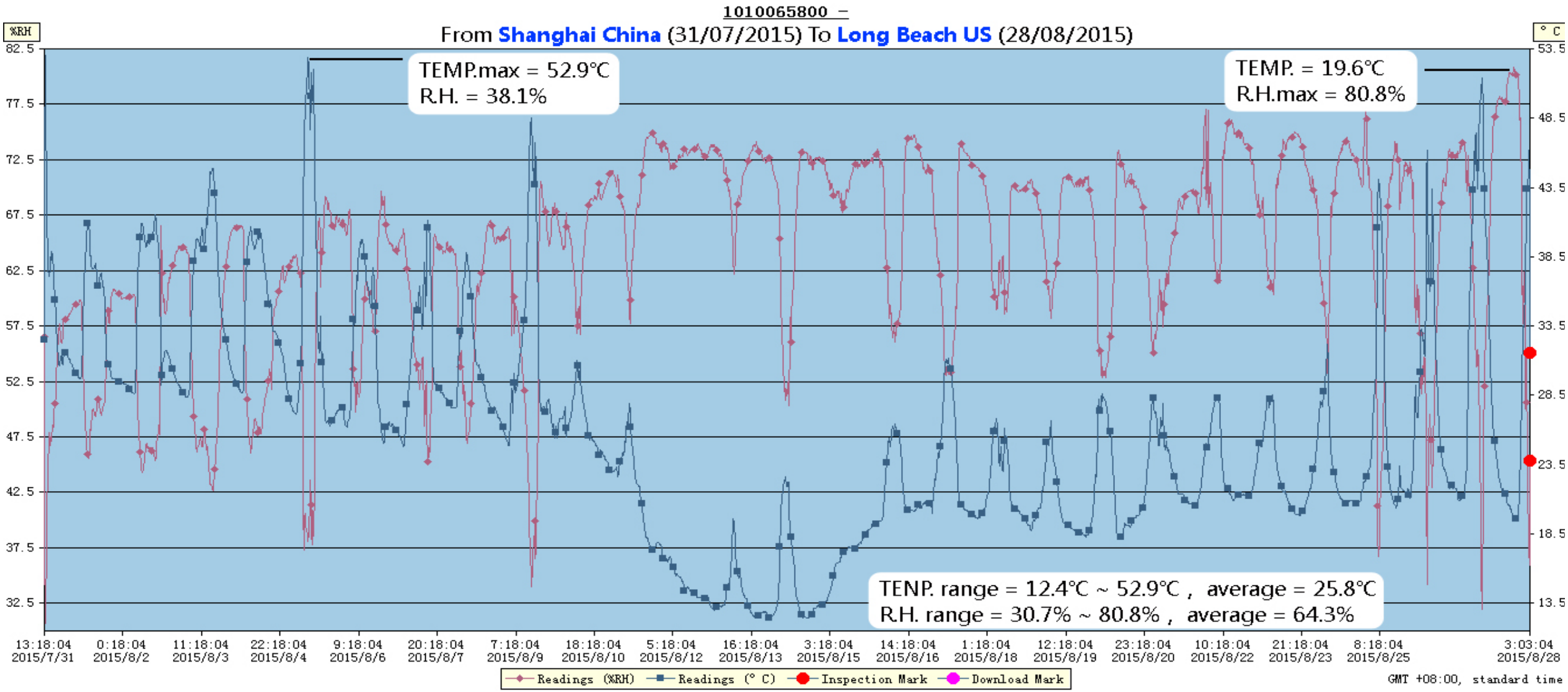
**Temperature at sea: 10 ℃ /50F**

Maximum water vapor content: 80grams/cbm - 9.4grams/cbm

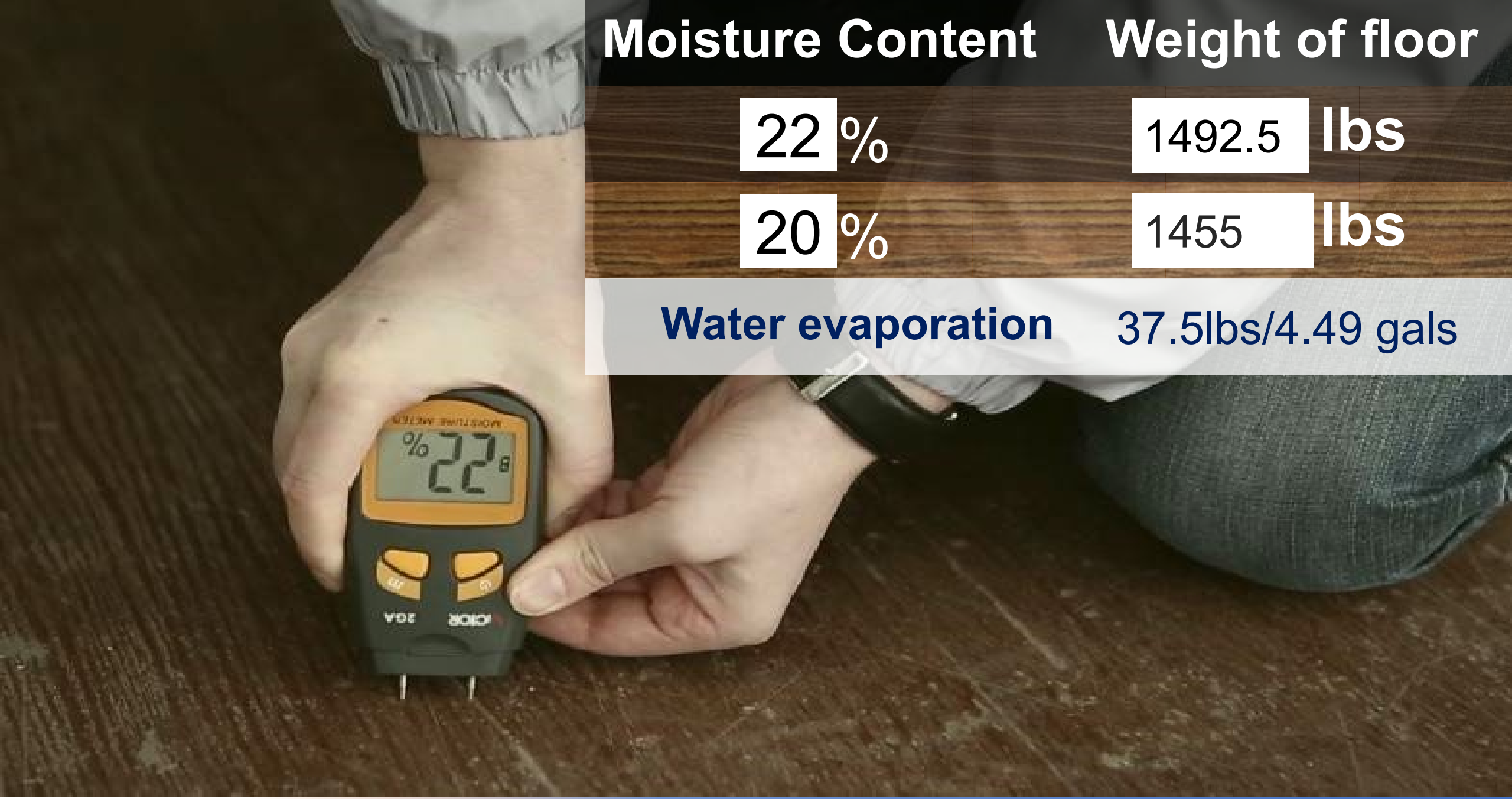
Water vapor released in closed container per cbm = 70.6grams

70.6 grams per cbm × 55cbm = 3.886 grams of water vapor, or 3.886 liters / 1.02 gallons

# Why we need desiccants




1. Why desiccant is necessary?


Moisture Content
Weight of floor
22 %
1492.5 lbs
20 %
1455 lbs
Water evaporation
37.5lbs/4.49 gals

# Principles for Correct Usage

Broadly Speaking

Two Categories of Moisture and Mold Damage Preventative Products:

1. Anti-Microbials
2. Desiccants

## Anti-microbial Products

How it works:
Create an anti-microbial substance by reacting with water.

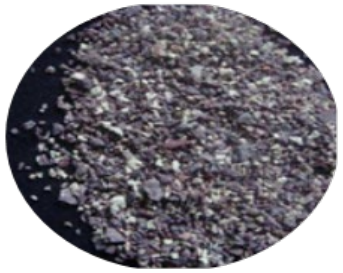
**Kill growing mold**

VS

## Super Dry Desiccants


How it works:
Cut off the water supply for mold growth by absorbing moisture

**Prevent mold growth**

| Desiccant | Description | Application Temp | Absorption rate |
|---|---|---|---|
|  | **Silica gel**<br>Physical absorption<br>Ingredient: $SiO_2$ | Below 35℃ | 10%-27% |
|  | **Clay**<br>Physical absorption<br>Also called montmorillonite/smectite | Below 50℃ | 15%-30% |
|  | **Calcium Chloride**<br>Chemical absorption<br>–Super Dry Desiccant<br>Ingredient: $CaCl_2$ | -5℃-90℃ | Up to 700% |

# SUPER DRY Desiccant versus Clay Desiccant

Test environment: 30℃, 90%RH

| Days | Super Dry DS 25g | | | Clay 32g | | |
|---|---|---|---|---|---|---|
| | Weight (g) | Water retention(g) | Absorption Rate | Weight (g) | Water retention (g) | Absorption Rate |
| 0 | 30 | - | - | 33.7 | - | - |
| 3 | 57.8 | 27.8 | 111.1% | 44.5 | 10.8 | 33.8% |
| 5 | 71.2 | 41.2 | 164.7% | 45.2 | 11.5 | 35.9% |
| 8 | 81.0 | 51.0 | 204.0% | 45.3 | 11.6 | 36.6% |
| 15 | 93.1 | 63.1 | 252.5% | 45.1 | 11.4 | 35.6% |
| 25 | 105.6 | 75.6 | 302.4% | 45.0 | 12.3 | 38.4% |

Super Dry typical effectiveness 60-120 days depending on conditions

## Why is the desiccant ingredient important?

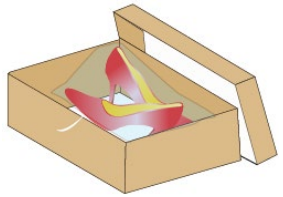
- SD absorbs nearly 3 time the amount of water vapor ending day 3, 6 times overall.
- Clay absorbs little after day 3.
- Clay outgasses water vapor into the cargo environment (day 15)

# Principles for Correct Usage

## What are we really doing??

1. Treating a **defined** volume of air.
2. Determining that volume = DOSAGE

# Suggested amount of desiccant

| Product | Manner of packing | Weight of Desiccant |
|---|---|---|
|  |  | *2g* |
|  |  | *5g* |

# No Shoe box? Determining Carton Volume/Dosage – (metric)

Select the desiccant dosage based on your package size

| Volume of the package(CBM) | Desiccant Dosage (g) | |
|---|---|---|
| | Wet season | Non-Wet season |
| Less than 0.01 | 2 | 2 |
| 0.01-0.029 | 5 | 4 |
| 0.03-0.059 | 12 | 7 |
| 0.06-0.089 | 20 | 12 |
| 0.09-0.119 | 30 | 20 |
| 0.12-0.19 | 40 | 25 |
| 0.20-0.39 | 75 | 50 |
| 0.40-0.59 | 125 | 75 |
| 0.60-0.79 | 175 | 110 |
| 0.80-1.00 | 250 | 150 |

- ***Package*** refers to carton, inner box or poly bag, etc.
- Our desiccants come in different sizes (weights), i.e. 2g, 5g, 10g, 25g, 50g, and 100g. They can be combined to reach the required amount needed.

**EXAMPLE**

Carton Size = 85cm. X 34cm. X 53cm.
= 0.153cbm
Recommendation: 40 grams wet season, 25 grams dry season

# Thank you.

# Questions?