

CLAY DESICCANT ZB

Desiccant is a drying agent used to combat humidity or moisture degradation.

PRODUCT INFORMATION SHEET

DESCRIPTION

An inert calcinated clay based Desiccant / Drying compound grey granules.

TYPICAL APPLICATION

Moisture Absorption

PACKAGING

International Standard Desiccant

PACKAGING MATERIAL

Tyvek Paper
Non Woven Paper
Net Paper
One Way Paper
Poster Paper
OPP plastic

TYPICAL PHYSICAL PROPERTIES

Explosion Limit	N/A
Solubility (water)	Insoluble
PH	6.5 ~ 7.4
% Volatile	None
Vapour	N/A
Moisture Content	<2% (150C°)
Consistency	0.82~0.87g/ml
Average Water Absorption	70%
Specific Resistance (W. cm)	>20,000
Surface Area (m ² /g)	>1,000
Pore Volume (ml/g)	>0.5
Avg. Pore Diameter. (Å)	<10
Specific Heat (Kcal/kg.)	>0.5
Thermal Conductivity	>0.3

PHYSICAL & CHEMICAL PROPERTIES

Melting/Boiling Point	N/A
Evaporation rate	N/A
Bulk Density	0.85~0.90
Flammability	Non combustible
Reactivity with :	
Air	None
Acid	None
Water	None
Alkali	None
Fire	None
Other	None

Remarks : RH 90 Temp 25°

TYPICAL CHEMICAL ANALYSIS

SiO ₂	81.80
Al ₂ O ₃	10.25
Fe ₂ O ₃	3.71
CaO	0.64
MgO	0.71
K ₂ O	1.46
Na ₂ O	0.58
Lg.Loss	0.85

Complies with or conforms to the following standards :

- US MIL Spec MIL D-3464 E
- US MIL Spec MIL-I-8835
- Japan Standard JEDEC-STD-033B
- U.K British Standard BS 1133

SHELF LIFE

Unopened Clay Desiccant remains in a usable state for a minimum of 12 months from the manufacturing date.

ABSORBENCY

Our Clay Desiccant is manufactured following guidelines for desiccant as set out under U.S.A Military Specification MIL D-3463 E. Absorbency differs depending on temperature and humidity with maximum take up. Currently averaging 70% absorbency.

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HEALTH HAZARD INFORMATION

Note : When use in accordance to instruction and the contents are not removed from the inner bag, no masks or special equipment are required.

POISON SCHEDULE

Hazard Chemical Code :	0
UN # :	N/A
Class :	N/A
Transport :	Non Hazardous
NH & MRC TLV :	
For respirable dust :	1mg/m ³
For respirable quartz :	0.1mg/m ³
Asbestos content :	NIL

Zanceo Resources performance packaging mission is to create systems and solutions that create a safe environment for our customers' products. Zanceo Resources is a manufacturer and supplier of desiccant absorber solutions. The company is a key supplier to the pharmaceutical, diagnostic, nutritional, furniture, electronic and food industries for desiccant canister, desiccant bag and desiccant packet.

Our vast experience in providing desiccant and packaging components to the all industries give us insight into the need for sound practices and requirements for packaging product intended for the health of the public.

MATERIAL SAFETY DATA SHEET

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

Product Name: Clay Desiccant; ZB
Manufacturer : Heng San Multisorb Sdn. Bhd.
Address : 7, Jln MJ/3, Jln Klang Lama, Medan Maju Jaya 46000, Selangor Darul Ehsan, Malaysia.
Telephone : (+603) - 7781 5987
Email : info@hengsan.com.my
Web : www.hengsan.com.my
MSDS Number: 06-149
MSDS Date: July 13, 2006

SECTION 2 FIRST-AID MEASURES

Reactivity is stable under normal temperatures and pressures in sealed containers.
Hazardous polymerization will not occur.

Spillage :

Clean up personnel need protection against inhalation of dusts or fumes. Eye protection is required.
Vacuuming methods of clean up are preferred.

Inhaled :

Many cause health hazards when inhaled, ingested or in contact with the eyes and skin.
Prolonged inhalation may cause irritation to the upper respiratory track and lung damage.
Contact with eye tissue may result in irritation.

Fire :

Nonflammable but negligible fire and explosion hazard when exposed to heat or flame by reaction with incompatible substances. When fire occur use dry chemical, water spray, or foam.
For larger fires, use water spray or foam.

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SECTION 3 FIRST AID

Inhalation :

Remove to fresh air immediately. If breathing has stopped, give artificial respiration
Keep affected person warm and at rest. Get medical attention immediately

Ingestion:

If large amounts have been ingested, give emetics to cause vomiting stomach siphon may be applied as well. Milk and fatty acids should be avoided. Get medical attention immediately

Eyes :

Wash eyes immediately and carefully for 30 minutes with running water, lifting upper and lower eyelids occasionally. Get prompt medical attention.

Skin :

To avoid repeated or prolonged contact with this chemical, use good hygienic practices
Wash with soap and a large amount of water. Get medical attention if irritation or
Inflammation develops.

SECTION 4 ACCIDENTAL RELEASE MEASURES

Procedures of Personal Precautions:

Wear appropriate protective clothing to minimize direct contact with skin or eyes and prevent inhalation.

Methods for cleaning up:

Sweep up with spade, place into a dry, clean, lidded container for disposal. Avoid raising dust.
Ventilate area and wash spill site after material pickup is complete.

SECTION 5 HANDLING PROCEDURES

Storage :

Transport is not regulated. Keep product dry to avoid deterioration. Protect shipper against physical damage.

Spillage :

As for normal trade waste. Sweep up and wash down residue, if any, with water

Waste

Disposal :

Dispose to industrial waste. This applies to product only. They may be different requirements for the used material, depending on the compound absorbed.

Fire

Explosion :

Non combustible. This applies to product only. Combustibility of the material may vary depending on the compound absorbed.

Extinguishing : Use extinguishing media suitable for the other material involved in the fire.

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Desiccant Usage per Container

The formula to calculate the amount needed for desiccant is very complicated and involve a lot of detail information, it depends, the amount of desiccant required is usually dependent on the following factors:

- 1 - Volume of air space to be desiccated
- 2 - Nature of the material to be protected
- 3 - Moisture surrounding the package
- 4 - Type of desiccant to be used
- 5 - Length of time for protection
- 6 - Atmospheric conditions (temperature and relative humidity) when/where the product is sealed and during subsequent shipment and storage

There are still many other factors for bigger amounts of moisture inside the container.

Examples of those factors are:

Container floor: Recent studies carried out by R&D department, proved that the moisture content of the wooden floors is higher than they used to be. That is partly because of the quality of the wood that is being used nowadays and partly because the floors are being cleaned with water and they are not dried out enough before being used.

Packaging: Wooden pallets always contain more than 20 % moisture, which always causes problems whichever products are put on the pallets. The packaging, often being cartons, contains a lot of moisture in itself, which will spread into the cargo or vaporizes into the air.

Products: The biggest factor of moisture inside a container is the products itself. The MC varies roughly spoken between 10% and 35%. When the MC reach the 25%, the cargo is in the danger zone.

Journey and climate factors: When all the above mentioned factors are controlled and there is still a problem, they surely are the conditions during transport. The first point of consideration is the transport time. It depends on the destination and more importantly the climate during shipment and final destination. Basically the changes in temperature and automatically the relative humidity is the cause of condensation. If long transits cannot be avoided, again our advice is to add more units to absorb the extra water molecules.

3 General Desiccant Usage Calculatetion Standard and Formula

Follow the **US MIL-D-3716A**, the desiccant absorption capacity need to be achieved as below :-

Typical water vapor adsorption capacity at 25 °C

At 20% relative humidity >= 10.0% of moisture

At 40% relative humidity >= 20.8% of moisture

At 80% relative humidity >= 31.2% of moisture

Follow to **US Military Standard (MIL-P-116)** , we need to know Bag Size.

Formula: Units = 0.011 x 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: Units = 0.011 x 160 sqin = 1.8

Units to use = 2 Units of desiccant

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Follow to **Electronic Industries Alliance - EIA 583**, we get to know the 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 to use = 1.8 units Use 2 units of desiccant.

Follow to **JEDEC Standard (IPC/JEDEC J-STD-033)**, we need to 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:

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

Unit to use = 1/6 unit of Desiccant.

Moisture Vapor Transmission Rate (MVTR) of Barrier Materials

Material	MV TR *	
	gm/m 2-day	gm/ft 2-day
Aluminum Foil Wrapping 0.025 mm	0.5	0.05
Aluminum Foil Wrapping 0.009 mm	1	0.09
Cellulose Films ('Cellophane') 400's MXXT Grade(Polyvinylidene Chloride Coated)	1.5	0.14
Polyvinylidene/Polyvinyl Chloride Films ('Saran') 0.005 cm		
Polyvinylidene/Polyvinyl Chloride Films ('Saran')0.0013 cm (0.0005 in)	3	0.28
Polyethylene Films ('Polythene') 0.0125 cm (0.005in)	4	0.37
Waxed Paper (45.5 kg (100 lb) per DC Ream)		
Cellulose Films ('Cellophane') 300's MSAT Grade (Cellulose Nitrate Coated)	7.50	0.7
Glassine Lacquered (16 kg (35 lb) per DC Ream)	9	0.84
Polyethylene Film ('Polythene') 0.005 cm (0.002) in)	10	0.93
Polyethylene Film ('Polythene') 0.0025 cm (0.001 in)	20	1.86
Polyethylene Coated Kraft (9 kg(20lb) per DC Ream)	30	2.79

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Simply put then is; How much moisture do you need to remove from inside the box or shipping container? If customer can provide detailed information we can in turn to provide a more detailed response. All performance characteristics are used to illustrate typical performances of the configurations by standard.

Product Material Range	Desiccant Usage Quantity	
	20 Foot Container	40 Foot Container
Hand stacked cartons of products (10 pallet)	24 x 1.5 Kg	48 x 1.5 Kg
Cartons, palletized on wood	24 x 1.5 Kg	48 x 1.5 Kg
Steel or Aluminum Rolled Product Packed with Timber Frames	24 x 1.5 Kg	48 x 1.5 Kg
Packaged and Packed without Timber	12 x 1.5 Kg	24 x 1.5 Kg
Coffee, Cocoa or Spices Packed in Jute Bag 25 or 50 Kg Long Voyage	35 x 1.5 Kg	70 x 1.5 Kg
Short Voyage	24 x 1.5 Kg	48 x 1.5 Kg
Non Specific Hydroscopic Cargo	35 x 1.5 Kg	70 x 1.5 Kg
Furniture Advised how packed before final recommendation	24 x 1.5 Kg	48 x 1.5 Kg
Hay and Straw	18 x 1.5 Kg	36 x 1.5 Kg
Canned Foods	24 x 1.5 Kg	48 x 1.5 Kg
Flour Packed Hot in 25 Kg bags	24 x 1.5 Kg	48 x 1.5 Kg
Packed Cold in 25 Kg bags	24 x 1.5 Kg	48 x 1.5 Kg

Remarks :

- 1 - There are many factors which will influence the decision regarding coffee and cocoa, normally it depends on the country of origin, and also the final destination. Moisture content of packed product needs to be established first.
- 2 - DO NOT place in direct contact with programmable logic controller or electrical circuits
- 3 - The guides are recommendations only, for further information please contact our technical support for placement of desiccant in containers.

All information is given in good faith but no guarantee of accuracy is made nor can we anticipate every possible application for our product non variations in manufacturing equipment any methods. Our products are therefore sold without warranty express or implied, and on the condition that the purchaser relies on his own ability to determine the suitability of each product for a particular purpose. Statement concerning the possible use of our products are not intended as recommendations for use. No liability is accepted for infringement of any patents.