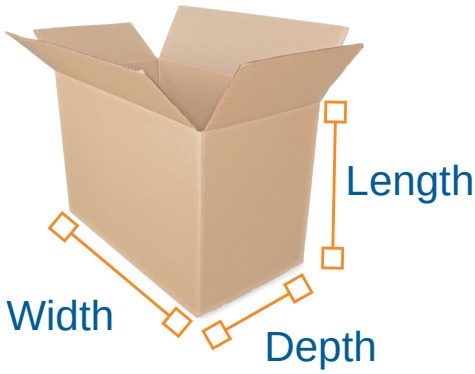
Calculating Inbox Desiccant requirements

1. Calculate Container Volume

Height (cm) x Length (cm) x Width (cm) = Volume (litres)



2. Decide how well sealed the items are

Completely sealed environment uses a VCI or similar moisture barrier packaging. A **well sealed environment** simply uses plastic wrapping.

3. Determine the desired relative humidity levels

The degree of a goods porosity will impact the humidity levels you would like to maintain. Food, fabrics and metal are at risk of humidity breeding mould and corrosion. Plastics may however be less prone to damage from high humidity levels. See overleaf for discussion on relative humidity and how it affects goods.

4. Crunch the numbers

Use the online Pro-Ex tool to calculate the quantities of desiccant required.

pro-ex.com.au/inbox-calculator/

5. Select the desiccant that best fits your needs

Desiccants are not all created equal. Active ingredients differ, so too the situations in which they can be used. Pro-Ex offer a number of desiccants in a variety of sizes and welcome any questions as to what will best suit your needs.

	Clay desiccant (MT)	Mineral desiccant (MD)	Silica Gel
Active Ingredient	Montmorillonite Clay	Calcium Chloride + Montmorillonite Clay	Silica Gel
Absorbing Capacity	30%	70%	30%
Advantages	+ Environmentally friendly + Conforms to MIL-D-3464	+ Superior absorption capabilities	+ Well known + Can be used with organic and metal cargo
Disadvantages	- Lower absorption capabilites	- Can not come in to contact with metallic cargo	- Requires relatively stable environment to work optimally. - Lower absorption capabilities

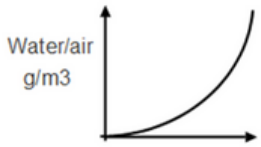
Relative Humidity explained

How humid the air depends on its Relative Humidity (RH). RH is the amount of moisture in the air as a percentage of the amount the air can actually hold. Warmer air can hold more moisture than cooler air. This means for a given amount of atmospheric moisture, RH will be lower if air is warm than it would be if the air is cool.

Entirely dry air has RH 0%. Maximum humid air has an RH of 100%. There is rarely any moisture damage if the RH is less than 70%, although there are some exceptions.

As a rough rule of thumb the amount of moisture the air can hold doubles for every 10 degrees Celsius over normal temperatures. If for instance air of 20°C and RH 50% is cooled to 10°C, the RH will reach 100%. Any further cooling will cause immediate condensation. If the air is then heated, the RH will drop below 100% and any condensation that had happened would over time re-evaporate back into the air.

Exponential relation between humidity and temperature



For each 10C of temperature increase, the amount of water the air can hold doubles.

How does Relative Humidty impact my goods?

The humidity of the air changes as a result of the change in temperature. When air cools it becomes more humid, even though the moisture content in the air remains the same. The humidity in a container will go up and down throughout the voyage, as a result of temperature fluctuations. If the temperature changes rapidly there is always a moisture risk, even if the container may be fairly dry.

Important factors to consider when selecting inbox desiccants:

- **Container**: Weather conditions when loading, the condition of the container, whether the container is airtight, whether the container was dry when loading?
- **Transport**: Route, Container position on vessel, Temperature differences, (Relative humidity, Duration and conditions during transport)
- **Goods**: Type of packaging, Dry or moist goods

Source: Bureau of Meterology, Absortech