

## Storage Chest for Solid Carbon Dioxide

- Cost Saving
- Solid CO<sub>2</sub> available longer after delivery
- Convenient
- Attractive
- Durable
- May also be used as low cost, low temperature test/storage cabinet



Solid carbon dioxide, at atmospheric pressure, changes direct from solid to gas and forms a very convenient low temperature coolant, leading to its wide use in laboratories and industry. It has a steady temperature of -78°C. This otherwise desirable property means that, if stored in delivery packaging, it has a short life particularly if in pellet form or if blocks are broken into fragments. Storage in a refrigerator, or even a freezer, is of little help because their operating temperatures are usually so much higher.

The storage chest is specifically designed for the storage of solid carbon dioxide, needs no power supply and can also be used as a low cost, low temperature, cabinet for preserving thermally unstable materials or for low temperature environmental testing. Taking into account the relative cost of solid carbon dioxide, it can provide significant cost savings soon recovering its own cost

and providing a high return on capital. As a bonus it helps avoid the frustration of work delayed until another delivery of solid carbon dioxide arrives.

The chest is made of polyester/glass fibre, to minimise thermal conductivity between the inner chamber and the outer walls. At these low temperatures condensation of atmospheric water vapour occurs and there is no risk of rusting, as may be the case with steel chests. The walls are self-coloured white, thus any accidental surface scratches remain hidden. The substantial void between inner and outer walls is filled with thermal insulant to reduce heat transfer and the lid has a protrusion which fits into the top of the storage space. Double silicone rubber seals on the lid are compressed by the catches, which secure the lid when closed. Easily opened on its rear hinges, the lid has a stay to hold it in the open position.

Four castors are fitted so that the chest is easily moved from one location to another. Pressing a lever, with the foot, on each of the front two castors locks them to immobilise the cabinet in any desired location. Lifting the levers frees the castors again.

The weight of material which the chest will hold and its typical storage life depend upon a number of factors. The dimensions both of blocks and pellets differ between manufacturers. Storage is also affected by the frequency of opening of the chest. The greater surface area of pellets gives a shorter life than for blocks. For more precise estimates it is necessary to check solid carbon dioxide manufacturers' specifications. Assuming that despatch amounts of material are around 10 to 11 kg per block or bag of pellets, the chest should hold two blocks (plus fragments remaining from earlier delivery) or two bags of pellets.

In a test where a pre-cooled chest was filled with blocks of solid carbon dioxide and was left unopened, some material still remained after two weeks. In practice, pellets are usually preferred for convenience. Reports suggest that two bags of pellets will last almost a week if usage is light.

It is possible to use the chest also as a storage container for thermally unstable materials (e.g. monomers and biological materials) to delay degradation. Then a quantity of solid CO<sub>2</sub> is used as coolant. Similarly the chest is suitable for low temperature environmental testing, assuring a steady temperature without dependence on power supplies



| Reference | Description                            |
|-----------|--|
| CO/CAB/3  | Storage Chest for Solid Carbon Dioxide |

| Dimensions :    | w                    | x | d         | x | h (cm)    |
|-----------------|----------------------|---|-----------|---|-----------|
| <b>External</b> | <b>67</b>            |   | <b>47</b> |   | <b>80</b> |
| <b>Internal</b> | <b>38</b>            |   | <b>19</b> |   | <b>44</b> |
| <b>Weight</b>   | <b>Approx. 20 kg</b> |   |           |   |           |