

# **IMPACT**

**A B S O R B T I O N**

## **ABSORB 350 – WINTERIZING PROCEDURE**

**Note:** The following document was written based on information available on the Dow Chemical website.

**Background:** In areas where cold weather may cause the water in the Absorb 350 to freeze, calcium chloride must be added to each element of the system. Calcium chloride can be obtained in three forms – a liquid solution, pellets and flakes.

The liquid solution is expensive and difficult to manage. The pellets do not dissolve easily. Therefore, the most efficient and cost effective form is flakes.

In order to achieve a freeze point of + 5° F, the required calcium chloride weight concentration is 17%. Since each element of the Absorb 350 system contains 70 gallons of water, it takes between 135-149 lbs. of calcium chloride flakes to winterize each element.

The exact amount depends on the strength of the calcium chloride being used. When using a 77-80% strength calcium chloride (DOWFLAKE™), each element requires 149 lbs. of product and 63.1 gallons of water. If the calcium chloride strength is 83-87%, (DOWFLAKE™ Xtra™), each Absorb element instead requires 135 lbs. of product to 64.7 gallons of water.

**Procedure:** Using (3-4) 5 gallon buckets and a siphon hose, displace 15-20 gallons of water from the Absorb element. Add the calcium chloride flakes slowly and in small batches, while making sure to mix well. If the flakes are poured too quickly or not mixed sufficiently, they will amalgamate at the bottom of the element. An air compressor with a blowpipe can be used to agitate the water, in order to properly mix the solution.

The dissolution of calcium chloride in water creates an exothermic reaction, which means it creates heat. The water temperature rises as the calcium chloride is added. For DOWFLAKE™ and DOWFLAKE™ Xtra, assume a temperature increase of 2.1° F and 2.8° F respectively per percent increase in concentration. Therefore, the 17% solution will increase the water temperature by 36-48° F.

When the mixing is complete, agitate the solution well with the air compressor. The Absorb should then be topped off with water.

**Suppliers:** The following suppliers are located in the NY area and presently have stock of the product. While their pricing is competitive, this list is by no means a comprehensive listing of all suppliers in the area.

**Peters Chemical Co. - Islip, NY (973) 427-8844 - Contact Harold**

Price: 50 lb. bag (77-80%) - \$13.40 per bag

**Siegel Bros. Supply - Brooklyn, NY (718) 387-0300 - Contact George**

Price: 50 lb. bag (77-70%) - \$24.04 per bag / Skid (48bags)  
\$19.99 per bag

#### **References**

*Calcium Chloride Handbook – A guide to properties, forms, storage and handling, The Dow Chemical Company.*

*Manual of Good Practice for Snow and Ice Control with DOW Calcium Chloride Products, The Dow Chemical Company.*

**Answer ID**  
5647**Freeze-proofing water-filled containers****Question**

What are the recommendations for use of calcium chloride to freeze-proof water-filled containers?

**Answer**

Technical grades of solid and liquid calcium chloride may be used to freeze-proof water-filled containers, such as traffic barriers. The target concentration depends primarily on the level of freeze protection desired. See below for the freeze points of typical concentrations.

Wt %	Sp. Gr.	lbs/gal	Freeze Pt
16%	1.149	9.55	+ 8 °F
20%	1.189	9.88	- 4 °F
24%	1.228	10.20	- 20 °F
28%	1.275	10.60	- 46 °F

A spreadsheet tool for making up solutions from solid product is available via the Answer Center. Search for Answer ID #5471, or keyword search "dissolving".

Dow has no data or experience relative to the use of calcium chloride for freeze-proofing portable toilets. Therefore, no technical support for this specialized application is available.

**NOTE:** The data and calculations in this spreadsheet are presented in good faith based upon present day technology and information provided, but no expressed or implied warranty is intended or given. Dow assumes no liability for any use of this spreadsheet nor any results obtained from the use of Dow products based thereon. July 17, 2007

**Calculation for Making Solutions of Different Strengths up to 43%**

Make entries in yellow cells only; calculated results are in grey cells

<b>Make Solution from DOWFLAKE™ 77-80%</b>	
Enter desired solution concentration (%):	17.0%
Solution density (lbs/gal):	9.63
Enter desired final volume (gal):	70.0
Amount of Dowflake 77-80% required (lbs):	149
Amount of Water required (gal):	63.1

<b>Make Solution from PELADOW™ 90%</b>	
Enter desired solution concentration (%):	17.0%
Solution density (lbs/gal):	9.63
Enter desired final volume (gal):	70.0
Amount of 90% Pellet required (lbs):	127
Amount of Water required (gal):	65.6

<b>Make Solution from DOWFLAKE™ Xtra 83-87%</b>	
Enter desired solution concentration (%):	17.0%
Solution density (lbs/gal):	9.63
Enter desired final volume (gal):	70.0
Amount of Dowflake Xtra required (lbs):	135
Amount of Water required (gal):	64.7

<b>Make Solution from Anhydrous 94% - 97%</b>	
Enter desired solution concentration (%):	17.0%
Solution density (lbs/gal):	9.63
Enter desired final volume (gal):	70.0
Amount of 94% Mini-Pellet required (lbs):	122
Amount of Water required (gal):	66.3

**CAUTION:** Use cool water! Significant temperature rise accompanies mixing. Add solid calcium chloride slowly while continuously mixing. The observed temperature increase during dissolving will vary depending on the conditions associated with each specific application. If solids are allowed to sit motionless in contact with water, a hard cake will form that will be slow to dissolve.

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