GRAINPRO® G-HF COCOON LITE™

INSTRUCTION MANUAL

MA4065RAD0518-1

GRAINPRO
STORING THE FUTURE

"A GREEN, NOT ONLY FOR PROFIT COMPANY"

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GrainPro® Inc.
5520 Connecticut Avenue. NW Washington, DC 20015
Tel : +1 202-921-6700
Email : sales@grainpro.com

GrainPro® Philippines, Inc.
Lot 46 Efficiency Avenue, Subic Bay Gateway Park I, Subic Bay Freeport Zone 2222 Philippines
Phone: +63 47 252 7884 Fax: +63 47 252 7885 Website: www.grainpro.com
Email: salesasia@grainpro.com

GrainPro® (Inc) Kenya Ltd.
Space Apartments, GF Shop A1 & A2 Maimahui Rd. Nairobi West, Kenya
Tel: +254 796 904 144
Tel.: +254 791 222 169
Email: africa@grainpro.com

GrainPro® Nigeria Ltd
6, Adu Street, Aguda-Ogba, Ikeja, Lagos
Email: africa@grainpro.com
Tel: +234 806 564 3156

GrainPro® Mexico, S de RL de CV
Cto. Garona No. 903, Sección Tres, Col. Amberes, 37237,
León, Gto. Mexico
Mobile: +52 (477) 392 0851
Email: guillermo@grainpro.com

GrainPro® Costa Rica S.R.L.
Residencial Valle del Sol, Calle Lajas, Casa #27 Alto de las Palomas,
Santa Ana, San José, Costa Rica
Tel: +506 2282 9129
Email: infogpcr@grainpro.com

GrainPro® India Post-Harvest Technology Pvt. Ltd.
Office Number 18A109, WeWork Berger Tower 18th Floor,
C-001/A2, Sector 16-B, Noida, INDIA – 201301
Landline: +91 120 515 0017
Customer Service: +91 960 292 0202
Email: praveen.gupta@grainpro.com

GrainPro® Inc., 1401 K Street NW, Suite 502, Washington D.C. 20005 USA

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1. INTRODUCTION

The GrainPro® G-HF Cocoon Lite™ is a gas-tight storage container designed for insecticide-free fumigation specifically CO_2 fumigation to immediately control any infestation and promote safe storage of agricultural commodities and comes to improve the performance, handling, and cost of the previous generation of PVC Cocoons. It is made of a lightweight yet uniquely developed sturdy laminated PE material for ease in handling. It has an extremely low Oxygen Transmission Rate (OTR) and low Water Vapor Transmission Rate (WVTR) to improve storage performance and it's optimal UV Protection to make the Cocoon Lite™ applicable for outdoor installation.

Standard sizes of the G-HF Cocoon Lite™ are from 5 Metric Tons to 20 Metric Tons capacities. It may also be used for Carbon Dioxide Fumigation by introducing CO2 gas into the side Inlet Port and discharging the Oxygen on top by an Outlet Port. For a more confident storing, Relative Humidity can be visually checked thru its transparent plug RH indicator, also a gas-sampling port for monitoring the Oxygen Level inside the G-HF Cocoon Lite™ using the GrainPro®Oxygen Analyzer.

1.1. FEATURES:

1.1.1. Preserves grain quality for long periods of storage.
1.1.2. Uses chemical free fumigation for immediate control of infestation (CO_2 Fumigation).
1.1.3. Safe storage of commodities without using toxic and harmful fumigants.
1.1.4. The product can be stored at ambient temperature instead of alternative, energy consuming cold storage method where low temperatures are required to prevent insect infestation and biochemical deterioration.
1.1.5. Weather-resistant and UV-protected (can be used indoor or outdoor).
1.1.6. Mobile and easy to install, no need for any infrastructure.
1.1.7. No maintenance and operation cost.
1.1.8. "Green" product fits the demands of organic growers
1.1.9. Inhibits mold growth and aflatoxin production.
1.1.10. Control's insect infestation by depleting oxygen and increasing carbon dioxide in a gas tight container.
1.1.11. Allows user to check oxygen and humidity levels.
1.1.12. A "green" technology for organic product storage.

1.2. PRODUCT GUARANTEE:

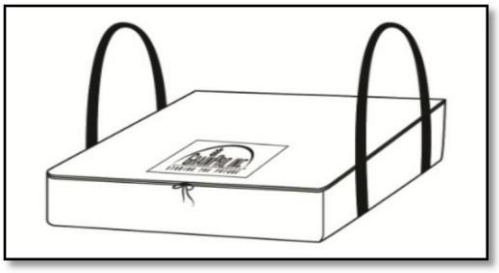
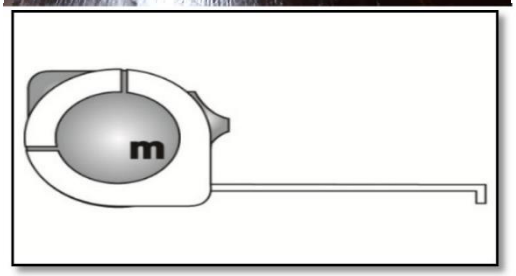
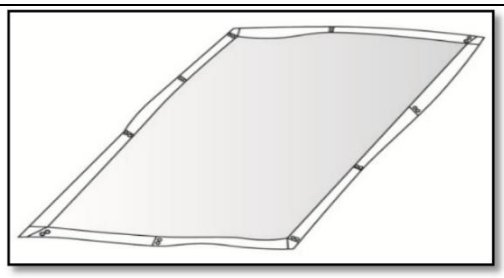
1.2.1. In accordance with the terms and conditions herewith, GrainPro® Inc. fully guarantees the quality of this product provided that it is used according to the instructions stated in this manual.
1.2.2. Please read and understand the manual thoroughly before using the Cocoon Lite.

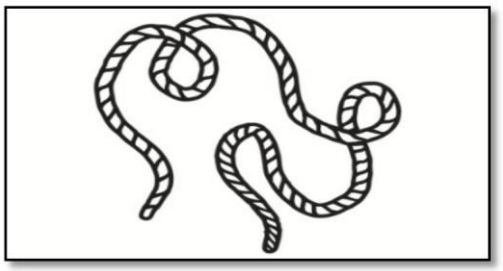
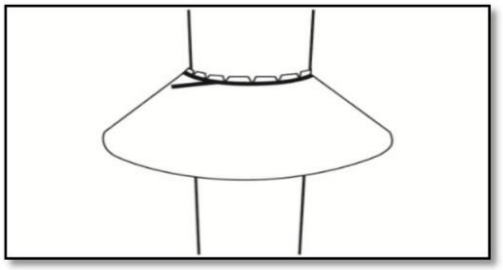
1.3. COMMENTS, COMPLAINTS, AND/OR CLARIFICATIONS:

1.3.1. Please contact customercare@grainpro.com.
1.3.2. We willing to answer your queries.

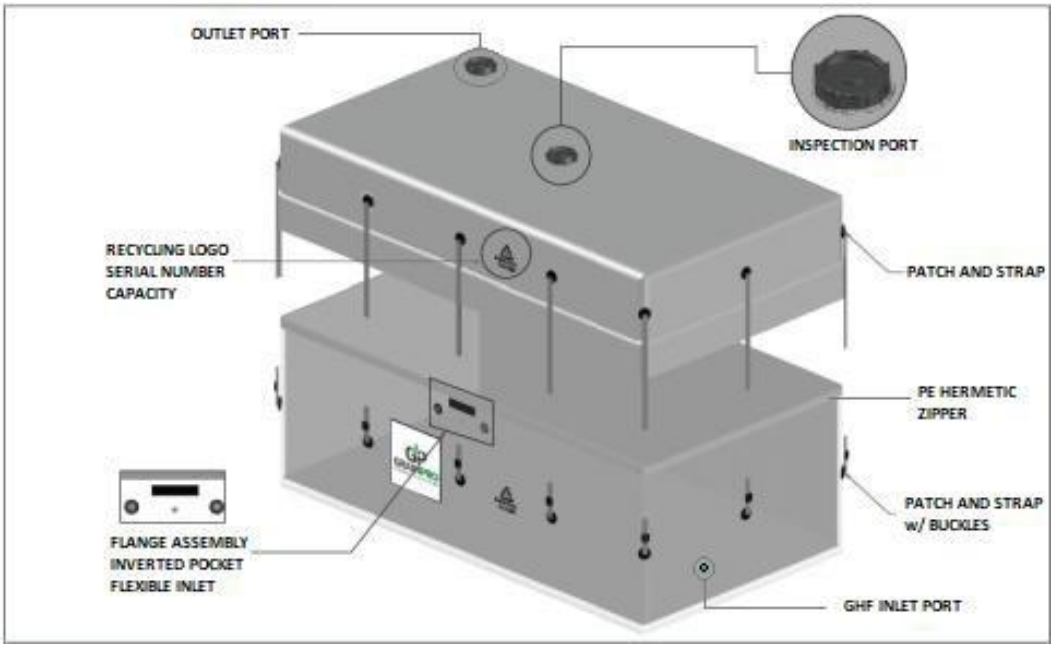
2. CHECKLIST

Please check your G-HF GrainPro® Cocoon Lite™ to ensure that the package includes the following items:

PART NAME	DESCRIPTION	IMAGE
2.1. CARRY BAG	2.1.1. Contents: a. G-HF Cocoon Lite™ (Top and Bottom) b. GrainShade™ c. Small parts d. Instruction manual e. Repair Tape	
2.2. ZIPPER PULL	2.2.1. For zipper sealing. 2.2.2. Two (2) pieces	
2.3. REPAIR TAPE	2.3.1. Repairing and patching of damages (holes, tears) 2.3.2. One (1) piece	
2.4. TAPE MEASURE	2.4.1. For checking height of stack. 2.4.2. One (1) piece	
2.5. GRAINSHADE™	2.5.1. For outdoor installation. 2.5.2 One (1) piece	

2.6. EXTRA ROPE	2.6.1. For tying the GrainShade™. 2.6.2. Ten (10) meters long (minimum length)	
2.7. RODENT GUARD	2.7.1. For platform posts to prevent rodent access when storing the empty Cocoon Lite™. 2.7.2. Four (4) pieces per pack	
2.10 INSTRUCTION MANUAL	2.10.1. Installation instructions 2.10.2. Maintenance instructions 2.10.3. Frequently asked questions and answers 2.10.4. Warranty Clause	

3. COMPONENTS



4. SPECIFICATIONS

4.1. MATERIALS	
PARAMETERS	STANDARD
Material	Cross Laminated Polyethylene with Barrier
Color	White
Weight, g/m^2	205
Oxygen Transmission Rate (OTR), cc/m^2/day @ 0.1MPa	<1
Water Vapor Transmission Rate (WVTR), g/m^2/day	2
Product Life, years	5
Warranty, years	2
Sealing mechanism	PE Gas tight Zipper

4.2. PRODUCTS					
Cocoon Lite	CAPACITY (MT)*	LENGTH cm (inch)	WIDTH cm (inch)	HEIGHT cm (inch)	VOLUME m^3 (ft^3)
GP-CL -005	5	300 (118)	160 (63)	150 (59)	7.2 (254)
GP-CL -010	10	338 (133)	294 (116)	150 (59)	14.91 (526)
GP-CL -020	20	450 (177)	330 (130)	200 (79)	29.70 (1049)

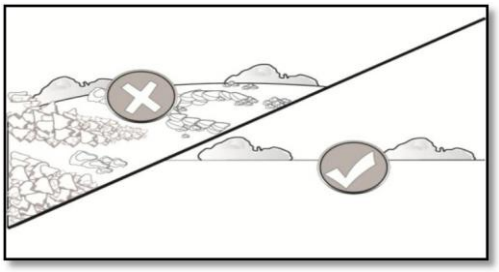
*Based on the density of wheat

5. INSTALLATION

5.1. SITE SELECTION

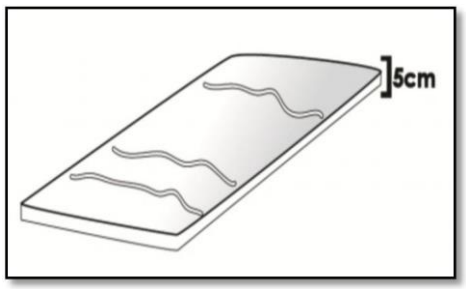
5.1.1. In selecting a site, look for:

a. G-HF Cocoon Lite™ is designed for both indoor and outdoor installations.
b. A smooth area away from standing or running water.
c. Ensure that the site is protected from stray animals and from theft.
d. Shade (otherwise under a GrainShade™) to minimize temperature differences.



5.1.2. Prepare the selected site by clearing away all sharp objects (stones, broken glass, nails, etc.) that may puncture the G-HF Cocoon Lite™. Sufficient space to accommodate the G-HF Cocoon Lite™ and an inspection path around (at least 50 cm each side).

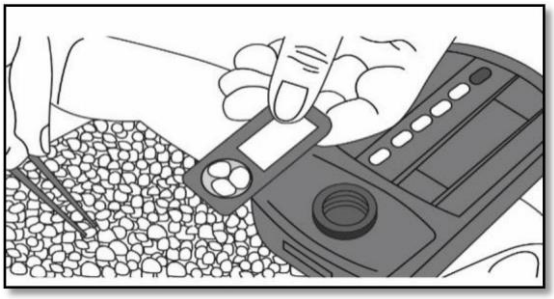
5.1.3. If ground will be used as flooring, put a layer (5cm) of fine sand (or any equivalent) on top of the soil as ground foundation.



5.1.3. During loading, make sure that workers do not wear shoes with spikes that may damage the G-HF Cocoon Lite™. Preferably, choose a site that offers ease in loading/unloading, away from crowded areas and rubbish. For indoor installation, clean the area to remove sharp objects.

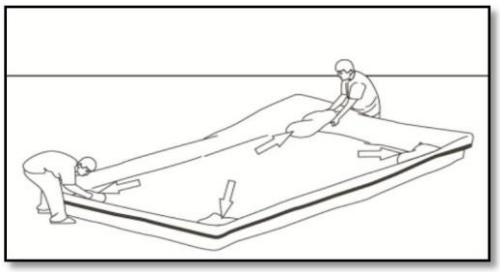
5.2. LOADING

5.2.1. Check the moisture content of the commodity to ensure the MC is at a safe level.



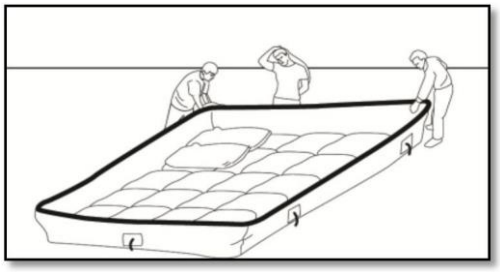
5.2.2. Loading the bottom section:

a. Unfold the bottom section of the G-HF Cocoon Lite™ and lay it out on the prepared site.
b. Start piling the sacks on the bottom section.
c. Put down the first four bags on every corner of the G-HF Cocoon Lite™ (one for each corner).
d. Make sure that the bottom section is stretched by pulling the corners with the bags. Stretching will reduce the risk of rodent damage.



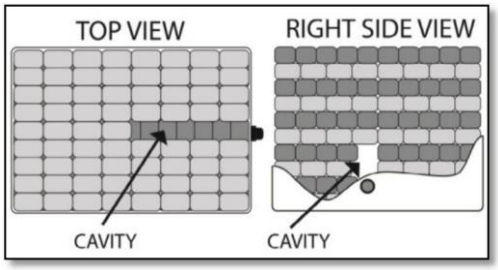
5.2.3. Required stack height:

a. Load the first layer of sacks in one direction.
b. Continue adding layers in an interlocking manner (criss-cross), i.e. one layer on the top of the previous layer.
c. Stack sacks to the corresponding heights.



5.2.4. Providing a cavity/canal for CO_2 flushing:

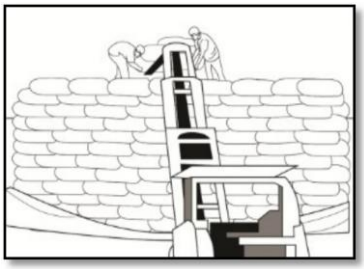
a. Create a cavity/canal about 1-2 layers (20cm wide-up) aligned with the inlet port to the center of the stack.
b. This will help facilitate CO_2 flushing and avoid dry ice build-up that may cause the G-HF Cocoon Lite™ liner becomes brittle that will eventually crack/explode.



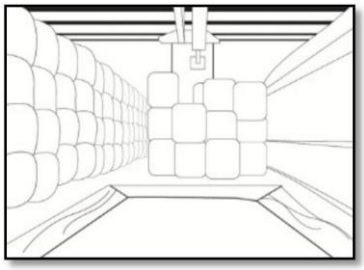
5.2.5. Mechanical loading of bagged commodity, optional for big sizes of G-HF Cocoon Lite™:

a. Stacking of grains involves diverse operations such as conveyor, forklift or crane.
b. Operations provide continuous stacking without delays especially for outdoor installation.

Conveyor



Forklift



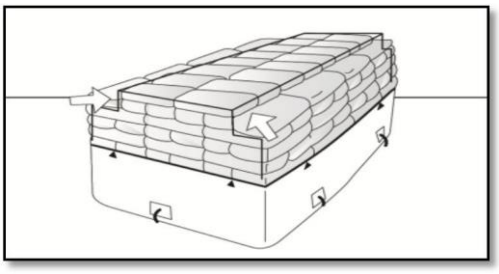
Crane

5.2.6. The top layer:

a. Continue piling the sacks until the desired G-HF Cocoon Lite™ height is reached.

b. Once you have reached the required stacking height, provide one line of sacks in the middle along the longitude of the stack.

c. This creates a crest that will keep rainwater from accumulating on the top of the G-HF Cocoon Lite™.

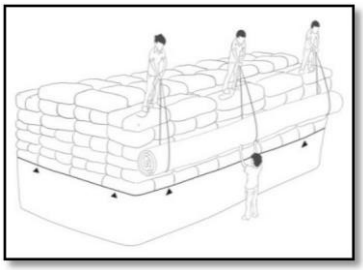


5.3. POSITIONING THE TOP SECTION

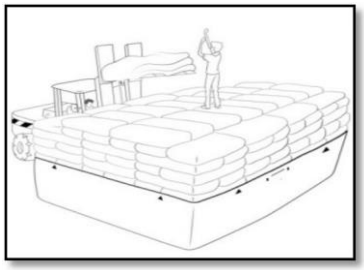
5.3.1. There are several ways to place the top section:

a. By the rolling.

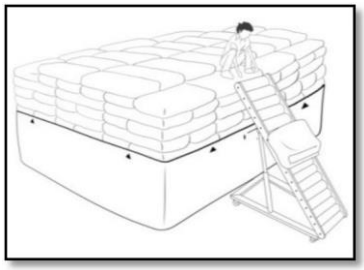
b. Using a mechanical aid (forklift and conveyor).



Rolling method



Use of forklift



Use of conveyor

5.3.2. Unfold the top section over the stack, and be sure that the top and bottom section arrows meet and make sure the tension straps are on the outside.

5.3.3. Pull the sides all the way down over the stack.

5.3.4. Do not pull or carry the top section by the tension straps.

5.4. USE OF DESICCANT (CALCIUM CHLORIDE, $CaCl_2$) - (RECOMMENDED))

Note: Desiccant (Calcium Chloride, $CaCl_2$) is not included in the package.

5.4.1. Required dosage of Calcium Chloride, $CalCl_2$.

COCOON LITE	CAPACITY	Desiccant Required ($CaCl_2$) for one (1) month of storage	Desiccant Required ($CaCl_2$) for six (6) months of storage
	(MT)	grams	grams
GP-CL -005	5	50	300
GP-CL -010	10	100	600
GP-CL -020	20	200	1200

5.4.2. Place the packed desiccant (Calcium Chloride, $CaCl_2$), at the middle-top portion of the bags inside the G-HF Cocoon Lite™ before Zipping.

5.4.3. If six (6) months of storage, spread-out the packed desiccant (Calcium Chloride, $CaCl_2$) at the top portion of the bags inside the G-HF Cocoon™ Lite before Zipping.

5.5. ZIPPING

5.5.1. Preparing to zip:

a. Insert one hand inside the inverted pocket.

b. Manually close the zipper track to a length of at least 30cm before using the zipper slider.

5.5.2. Engaging the zipper slider:

a. Insert the lower section of the zipper (attached to bottom section of G-HF Cocoon Lite™) to the zipper slider first.

b. Insert the top section of the zipper (attached to the top section) to the zipper slider. Make sure that the two zipper sections are aligned and are overlapping each other.

c. Move the zipper slider towards the engaged zipper section until the zipper slider is completely aligned/locked with the engaged zipper section.

5.5.2. Using the zipper slider:

a. After engaging the zipper slider, pull the zipper to start the zipping/closing process.

B. To make zipping easier, a second person should pull the top and bottom liners' zipper tracks close to each other which will serve as guide while the zipper pull advances.

5.5.3. Completing the zipping process:

a. As you go around the G-HF Cocoon Lite™, take note of the marks ("arrows") printed on both top and bottom sections in pairs. The markings at the top section are located just a few centimeters above the zipper.

5.5.4. Removing the zipper pull:

a. When you have zipped G-HF Cocoon Lite™ sides and reached the inverted pocket, take the zipper slider off the track by disengaging first the lower section from the slider and then disengage the zipper slider from the bottom zipper section.

b. Close the last few centimeters of the zipper track by sliding the fingers into the inverted pocket and close the zipper manually by pressing the zippers against each other.

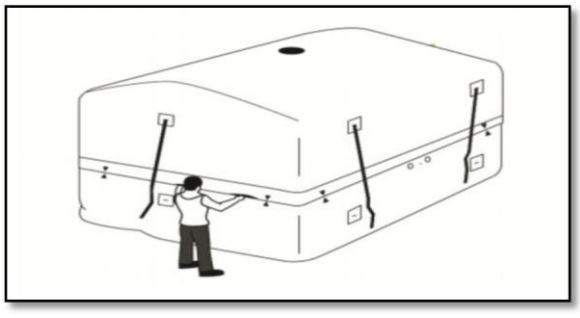
5.5.5. Ensuring a complete hermetic closure:

a. Check to ensure the entire length of the zipper track is fully closed.

b. If not, press the zipper halves together by hand.

NOTE:

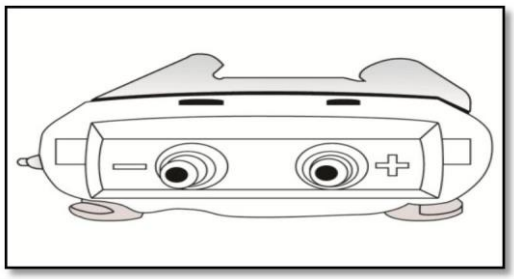
- Dirt or other objects on the zipper track can prevent it from closing completely. So it's important to clean the zipper tracks before closing/zipping.



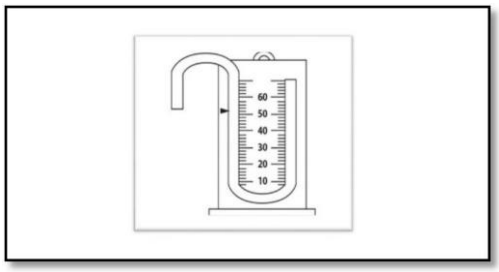
5.6. PRESSURE DECAY TEST (PDT)

5.6.1. After completely zipping and closing all the ports of the G-HF Cocoon Lite™, perform a Pressure {Vacuum} Decay Test (PDT) to ensure gas-tightness:

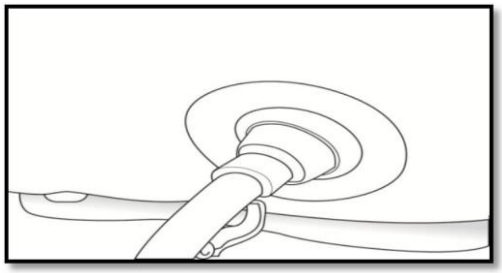
a. Use a digital manometer.



5.6.2. Either, a commercially available or improvised U-tube manometer can be used to monitor the pressure.



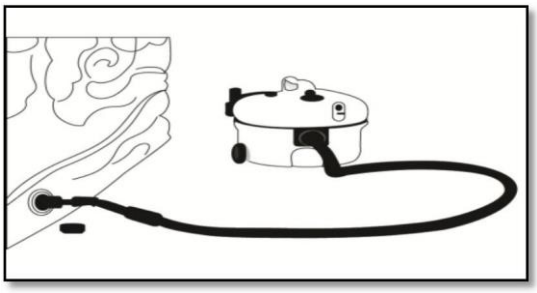
5.6.3. Connect the manometer hose into the flexible inlet (gas sampling port) of the Cocoon lite.



5.6.4. Use a vacuum pump [at least 2.3 cubic meters per minute with 600 Watts (0.80 horsepower) centrifugal pump]:

a. Connect the vacuum pump hose to the inlet port of the Cocoon lite.

b. Create at least -250 Pascals (Pa) or -25 millimeters' water (mm H_2O) vacuum. Doing this can also help engage the zipper tracks properly as there may be imperfections during zipping.

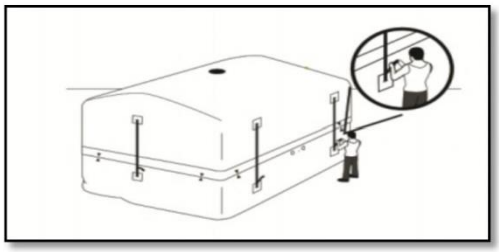


a. For it to be considered sufficiently airtight, the final pressure should not be greater than one-half (½) of the initial pressure (created by the vacuum pump) within five (5) minutes.

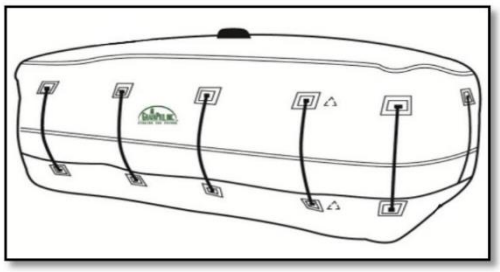
b. If the PDT test failed, check for holes/tears and poorly sealed zippers then repeat the PDT procedures.

5.7 TENSIONING OF STRAPS

5.7.1. Pull the protective flap down over the zipper track. Tighten the straps to pull any slack on the sidewall up away from the ground. Check that the protective flap over the zipper track is not displaced.



5.7.2. The tension straps are long enough to raise and apply tension to the sides of the G-HF Cocoon Lite™, even if it is only three-quarters full. The required tension can be achieved by attaching the cords to the buckles of the G-HF Cocoon Lite™.



5.8 PROCEDURE FOR PURGING CARBON DIOXIDE (CO_2)

5.8.1. Calculation:

a. Total Volume – Volume Occupied by the Commodity.

b. For every 2.0kg of CO_2 replaces 1 cubic meter of air.

c. Additional 15% will be added to the total capacity.

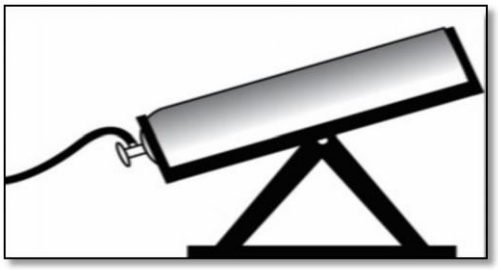
d. Formula: (1-Bulk Density) x Volume x 2 x 1.15.

COMMODITY	BULK DENSITY	AMOUNT OF CARBON DIOXIDE (CO_2) FOR PURGING, kg							
		5MT	10MT	20MT	50MT	100MT	150MT	300MT	320MT
	MT/m^3	7.50	15.00	30.00	78.32	150.0	227.00	414.00	856
Barley	0.62	7	13	23	68	131	198	362	750
Cashew nuts	0.50	9	17	30	90	173	261	476	987
Chia seeds	0.68	6	11	19	57	110	167	304	630
Chickpeas	0.74	4	9	16	47	90	136	248	513
Cocoa beans	0.56	8	15	26	79	152	230	419	868
Coffee beans	0.59	7	14	25	74	141	214	390	809
Cotton seed	0.40	10	21	36	108	207	313	571	1184
Cowpea	0.75	4	9	15	45	86	131	238	493
Maize	0.72	5	10	17	50	97	146	267	553
Millet	0.63	6	13	22	67	128	193	352	730
Mung bean	0.75	4	9	15	45	86	131	238	493
Oats	0.43	10	20	34	103	197	298	543	1125
Paddy	0.60	7	14	24	72	138	209	381	789
Paddy, rice bran	0.55	8	16	27	81	155	235	428	888
Peanuts, shelled	0.64	6	12	22	65	124	188	343	710
Rice, milled	0.80	3	6	11	32	62	94	171	355
Rye	0.72	5	10	17	50	97	146	267	553
Sesame	0.59	7	14	25	74	141	214	390	809
Sorghum	0.72	5	10	17	50	97	146	267	553
Soybean	0.75	4	9	15	45	86	131	238	493
Sunflower	0.41	10	20	35	106	204	308	562	1164
Wheat	0.77	4	8	14	41	79	120	219	454

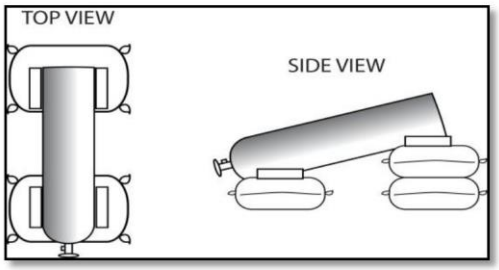
5.8.2. CO_2 application:

a. Make sure that enough CO_2 is available on-site. The weight of the CO_2 in the cylinder is supplied by the industrial companies (i.e., 22 kg standard capacities which may be used to calculate the number of cylinders required). CO_2 cylinders are available with or without siphon (dip tube). For rapid flushing, the cylinder without siphon should be inverted.

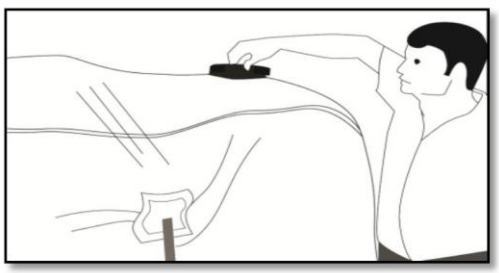
b. For rapid flushing, the cylinder should be inverted using mechanical inverter. However, the cylinders with siphon should be in upright position during flushing.



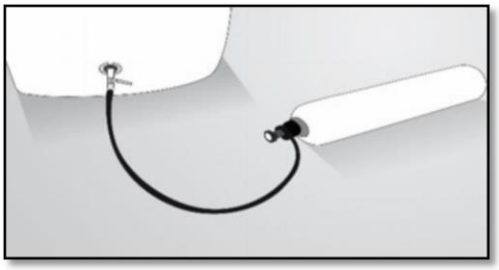
c. If a mechanical inverter is not available, a makeshift inverter can be made using sandbags or other improvised technique. The cylinder should be inverted with its top resting on one sandbag and the bottom end resting on pile of two or three sandbagshigh.



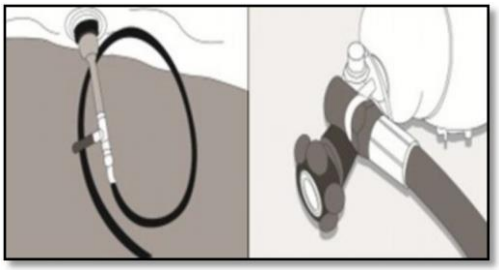
d. Open the outlet port located at the back (top) of the G-HF Cocoon Lite™ to relieve excess pressure and to release air from inside.



e. A Snap-on standard high-pressure hose (not supplied/separate item) should be connected between the cylinder and the gas inlet port. This hose should be guaranteed to withstand a pressure of 88 atmospheres (1,300 psi, or 92 kg/cm^2). Ensure that all connections are made properly, and gaskets are in place where they are required. The high- pressure hose should have a length of about 2-meter to facilitate easy connection to the inlet valve.



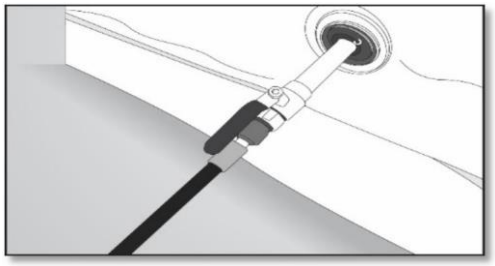
f. Open the gas inlet port of the G-HF Cocoon Lite™ and then open the cylinder tap. The cylinder tap should only be turned to a point where you can hear the liquid pass through the hose into the G-HF Cocoon LIte™. The liquid CO_2 flushes into the G-HF Cocoon Lite™ and evaporates inside through the expansion pipe and will push the air upward starting from the bottom core, following the piston effect, until the air is totally replaced.



5.8.3. Ice formation along the pressurized hose and the pipe connector during CO_2 flushing:

a. During this procedure, some ice may form around the gas inlet port and high-pressure hose.

b. If this happens do not touch the PEliner at this point because it becomes brittle, loses flexibility, and may crack!



c. Flushing (emptying of the cylinder) depends on the amount of CO_2 to be applied. Emptying one 22kg cylinder should only take about 20 to 30 minutes. If the pressure hose or the inlet valve gets blocked with ice, this is an indication that the CO_2 is being released too quickly. If this happens the cylinder should be closed until the ice melts, and then the cylinder tap should be re-opened and adjusted to reduce the flow.

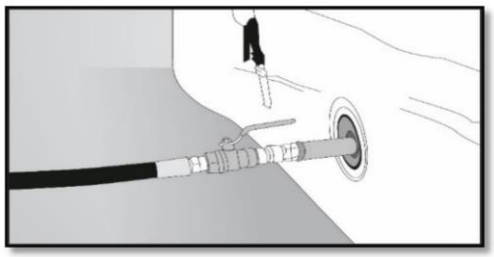
d. An additional indication that the gas is being released too quickly is when the G-HF Cocoon Lite™ begins to balloon out because pressure begins to build-up inside. If this happens, the gas flow should be decreased at the cylinder tap until the rate of air being expelled through the outlet port is about the same as the rate of CO_2 entering the G-HF Cocoon Lite™.

e. If necessary, for small scale applications and the cylinder is not inverted, weighing scales may be used to control the weight of the gas delivered. In this case the gas is released slowly, through a pressure gauge adjusted to control the flowrate.

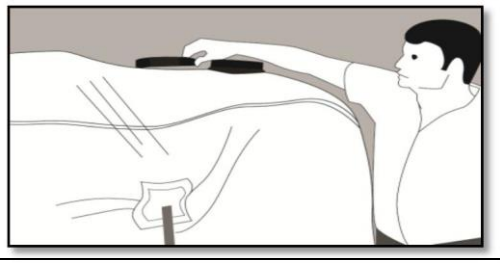
5.8.4. Since CO_2 is heavier than air, the air inside the G-HF Cocoon Lite™ will be pushed upwards and out of the container through the outlet port. Complete displacement of oxygen is not possible as there is always some mixing at the interface between the air and the CO_2. However, if the final CO_2 concentration reaches 80% then the O_2 concentration in the remaining air amounts to 4%. This mixing of the CO_2 with the remaining air, and absorption of CO_2 by the commodity, will take 12-24 hours depending on temperature. This will also be the time to determine the initial concentration of CO_2.

5.8.5. After the required weight of CO_2 has been applied, immediately:

a. Close the CO_2 cylinder tap and the inlet port of the G-HF Cocoon Lite™.



b. Close the outlet port of the G-HF Cocoon Lite™.



5.9 MONITORING THE OXYGEN LEVEL AND RELATIVE HUMIDITY (RH%)

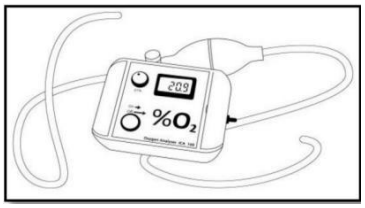
5.9.1. Recommended pest reduction timeline:

a. Leave the G-HF Cocoon Lite™ closed for two weeks at a minimum of 35% CO_2 (13% O_2) concentration to eliminate all stages of insects and achieve best result.

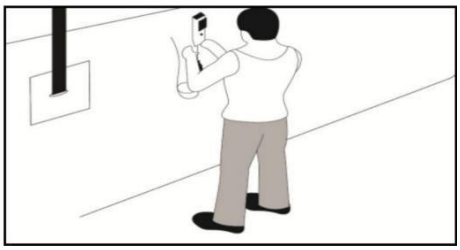
b. When storing commodities, leave the G-HF Cocoon Lite™ sealed until it is unloaded completely.

5.9.2. Use of oxygen analyzer:

a. During the first 15 days of installation,oxygen level should be checked daily using the oxygen analyzer.



b. Succeding monitoring should be done twice a week. Normally, oxygen levels should drop 1-2% per day to a level less than 3% (though lower levels have been observed as well). Oxygen level may go up by a few percent but, must not exceed 7%. Except for coffee beans and seeds, in this situation, sealing is probably compromised, and the commodity may not be adequately protected.



5.9.3. When carrying-out a CO_2 treatment, the approximate CO_2 concentrations can be determined by measuring O_2 concentrations using below conversion table:

O_2	CO_2	O_2	CO_2	O_2	CO_2	O_2	CO_2	O_2	CO_2	O_2	CO_2	O_2	CO_2
0.0	100	3.0	85.7	6.0	71.3	9.0	56.9	12.0	42.6	15.0	28.3	18.0	13.9
0.2	99.0	3.2	84.7	6.2	70.3	9.2	56.0	12.2	41.6	15.2	27.3	18.2	12.9
0.4	98.1	3.4	83.7	6.4	69.4	9.4	55.0	12.4	40.7	15.4	26.3	18.4	12.0
0.6	97.1	3.6	82.8	6.6	68.4	9.6	54.1	12.6	39.7	15.6	25.4	18.6	11.0
0.8	96.2	3.8	81.8	6.8	67.5	9.8	53.1	12.8	38.8	15.8	24.4	18.8	10.1
1.0	95.2	4.0	80.9	7.0	66.5	10.0	52.2	13.0	37.8	16.0	23.4	19.0	9.1
1.2	94.3	4.2	79.9	7.2	65.6	10.2	51.2	13.2	36.8	16.2	22.5	19.2	8.1
1.4	93.3	4.4	79.0	7.4	64.6	10.4	50.2	13.4	35.9	16.4	21.5	19.4	7.2
1.6	92.3	4.6	78.0	7.6	63.6	10.6	49.3	13.6	34.9	16.6	20.6	19.6	6.2
1.8	91.4	4.8	77.0	7.8	62.7	10.8	48.3	13.8	34.0	16.8	19.6	19.8	5.3
2.0	90.4	5.0	76.1	8.0	61.7	11.0	47.4	14.0	33.0	17.0	18.7	20.0	4.3
2.2	89.5	5.2	75.1	8.2	60.8	11.2	46.4	14.2	32.1	17.2	17.7	20.2	3.4
2.4	88.5	5.4	74.2	8.4	59.8	11.4	45.5	14.4	31.1	17.4	16.8	20.4	2.4
2.6	87.6	5.6	73.2	8.6	58.9	11.6	44.5	14.6	30.1	17.6	15.8	20.6	1.4
2.8	86.6	5.8	72.3	8.8	57.9	11.8	43.5	14.8	29.2	17.8	14.8	20.8	0.5

5.9.4. Use of humidity inidicator:

a. The humidity indicator is a special circular paper with moisture-sensitive chemical. Its color changes from blue to pink when relative humidity exceeds 65%, and vice versa.

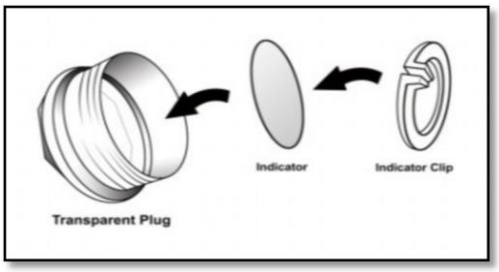
b. The humidity indicator provides an affordable and quick reference to relative humidity inside the G-HF Cocoon Lite™.

c. It is easy to use and does not require meticulous preparation for installation.

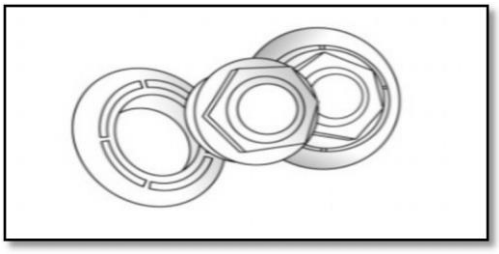
d. The material is non-toxic, and disposal doesn't need any special treatment.

e. Procedures on how to use the humidity indicator:

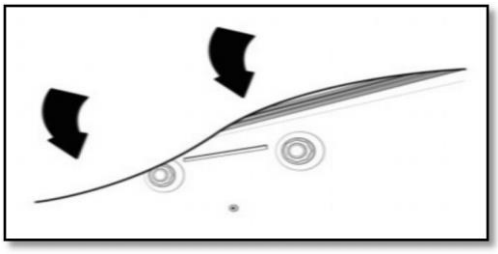
Get humidity indicator from the pack



Put the humidity indicator inside the transparent plug using the clip



Attach the transparent plug to the threaded flange tightly



Hide the humidity indicator with the zipper cover

5.9.5. Instruction when Indicator turned Pink:

a. Replace the pink indicator with an unused (blue) indicator. Make sure the plug is dry and the replacement is done quickly (Cover threaded flange to not let in too much air inside).

b. Monitor the indicator for 4-8 hours.

c. If the indicator turned pink within 4-8 hours, use other devices to check for the humidity inside or consult GrainPro®.

d. If the indicator did not turn pink, continue to monitor. Repeat procedure if the indicator changes.

Note:

- Place unused Humidity indicators on a sealed container with the included desiccant.
- Humidity indicator cards with pink or lavender spots can be turned to a blue color by placing indicators in a sealed container with 33grams (I unit) of desiccant for 4-8 hours or oven dry for 10-20minutes, set the oven to 50°C (122°F).

5.10. DISMANTLING

5.10.1. Although CO_2 is not toxic, it is an asphyxiant and is advisable to unzip the G-HF Cocoon Lite™ and wait until most of the CO_2 has dispersed.

5.10.2. Although the G-HF Cocoon Lite™ may be progressively filled over several days as the commodity is harvested and provided, they have the same moisture content, it is not recommended to top-up a G-HF Cocoon Lite™ that is still partially filled from a previous harvest, with commodity brought in from the new harvest. This is because when the new commodity is tapped from top, the old commodity from the previous harvest is left at the bottom.

5.10.3. This commodity will only be unloaded at the end of storage:

a. Unfastening the tension straps.

b. Using a coin, insert and twist the zipper (sharp objects should not be used for opening the zipper).

c. Gently pull the two sections apart, taking the top section completely off.

d. Remove the sacks of stored commodities (again, a stairway of sacks might make the job easier).

6. PREVENTING CONDENSATION

6.1. WHY DOES CONDENSATION OCCUR?

6.1.1. Condensation is caused by temperature difference i.e., hot weather by day and cool at night or sudden rains in a hot sunny day. When air collides with a cool surface at dew point temperature the water in the air condenses on the surface. Air movement inside the G-HF Cocoon Lite™ follow the natural forces i.e., in convection currents hot air rise and cool air sinks (except for the phenomenon called inversion). Hence, when warm air inside the G-HF Cocoon Lite™ rise and hit the cool G-HF Cocoon Lite™ top cover at dew point temperature, condensation reaction occurs, and water condenses.

6.1.2. Therefore, avoiding trapped warm air inside the G-HF Cocoon Lite™ can prevent condensationat the top layer. This is the role of the GrainShade™ i.e., Prevents heating up the air inside the G- HF Cocoon Lite™ by repelling solar radiation. Condensation can be checked manually throughthe Inspection port. Close the inspection port properly after checking.

6.2 MOISTURE CONTENT (MC) REQUIREMENT FOR SAFE STORAGE

6.2.1. Commodities should be dried before storage to at least 12% MC for sorghum, 9-10% millet, 12-14% for paddy and maize, and 13% for wheat.

6.2.2. When the commodity is properly dried, there is virtually no “free water” that the microorganisms can use to process the nutrients in the stored product for their growth and development.

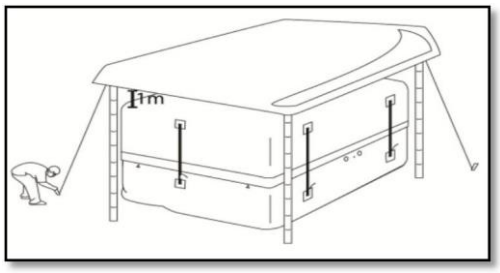
6.2.3. This condition can be maintained by avoiding ambient air (with variable moisture content) to be in contact with the dried product using the hermetic storage technology.

6.3 SETTING-UP THE GRAINSHADE (OUTDOOR INSTALLATION)

6.3.1. Ensure that the poles are rigid and stable:

a. Use poles (pipe, lumber, or bamboo) at least 1.5 meters away from eachcorner and 1.0 meter higher than the G-HF Cocoon Lite™.

b. Connect the corners of the GrainShade™ to apex of the poles, maintaining at least 1-meter clearance between the top surface of the G-HF Cocoon Lite™ and the GrainShade™.



c. Additional wires to reinforce the pole by tying at the top with the other end pegged to the ground away from the pole.

6.3.2. If poles are not feasible, tie the GrainShade™ to nearby posts, walls, tree branches, or pegs for support.

6.3.3. To prevent from sagging and flapping during rain and strong wind, install a wire or rope beneath and above the GrainShade™.

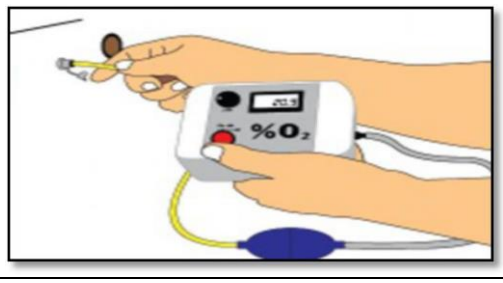
7. MAINTENANCE AND CARE

7.1. REGULAR EXAMINATION

7.1.1. Measure oxygen concentration using Oxygen analyzer (GrainPro® Handheld or ICA model).

a. First-two weeks- Daily.

b. Succeeding days- Twice a week.



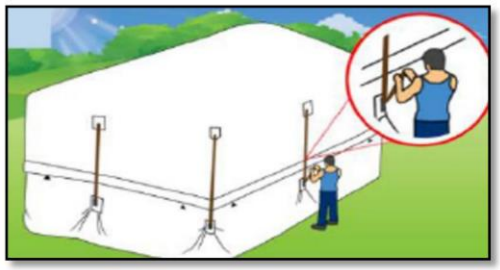
7.1.2. Check (at least weekly) possible condensation by opening (and re-closing) the checking port.

7.2 PHYSICAL INSPECTION

7.2.1. Check the zipper track for any small opening/s and push the opened track section by hand.

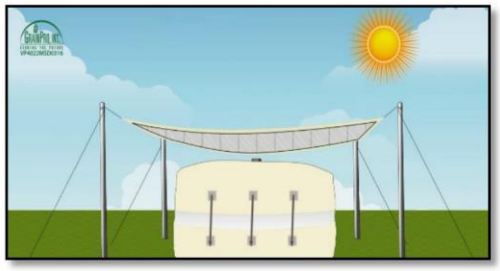
7.2.2. No slack material should be developed near the ground.

7.2.3. If slacks are observed, re-adjust the tension straps to pull up any slack side wall away from the ground.



7.2.4. During rainy season, the upper surface of the G-HF Cocoon Lite™ should be regularly inspected for water accumulation and damages that would permit water to sip into the G-HF Cocoon Lite™. The stored commodity is not adequately protected if the G-HF Cocoon Lite™ is not completely sealed.

7.2.5. Re-tensioning of wires to prevent from sagging and flapping during rain andstrong wind.



7.3 REPAIRING PUNCTURES AND OTHER DAMAGES

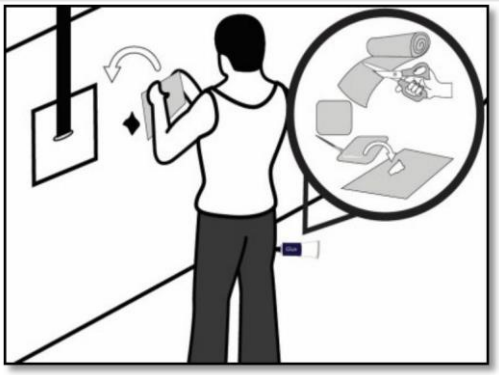
7.3.1. Repair procedures:

a. Use the repair tape found in the repair kit to patch the damaged section.

b. Clean the surface of the damaged area with damp cloth and allow to dry before applying the repair tape.

c. Cut-out a piece large enough to cover the damaged section to be applied at the outside surface of the G-HF Cocoon Lite™.

d. Manually press the patching tape against the damaged area.



7.3.2. Protective maintenance:

a. Check the patched repair tape occasionally and replace or re-patch if necessary.

7.4. CLEANING TOP AND BOTTOM SECTIONS

7.4.1. If necessary, clean with soap and water.

7.4.2. Dry under the sun.

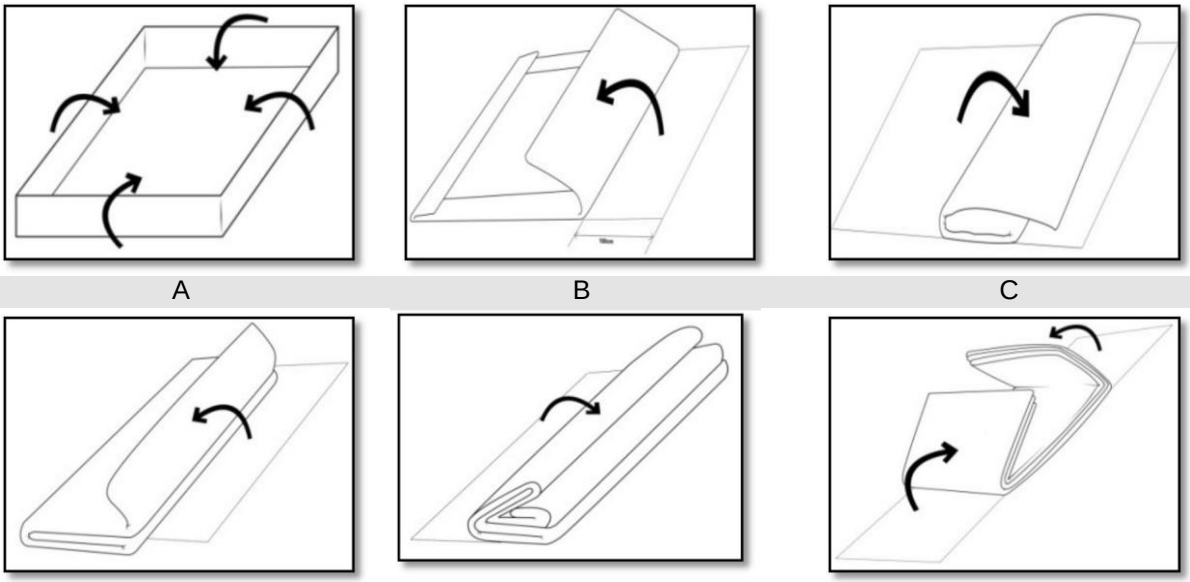
7.5 FOLDING

7.5.1. Measure 180cm from the end and fold inside.

7.5.2. Fold any extra material and finally fold in half.

7.5.3. Fold the material lengthwise until it fits in the carrying bag.

7.5.4. Folding procedures and repacking of the G-HF Cocoon Lite™:



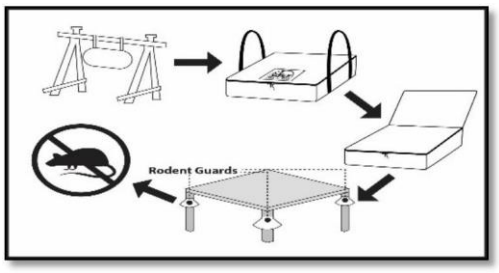
A B C

D E F

7.6 SAFEKEEPING

7.6.1. The empty G-HF Cocoon Lite™ should be stored away from heat or direct sunlight and away from rodent.

7.6.2. Do not place heavy object on top of the stored liner as it may damage or deform it.

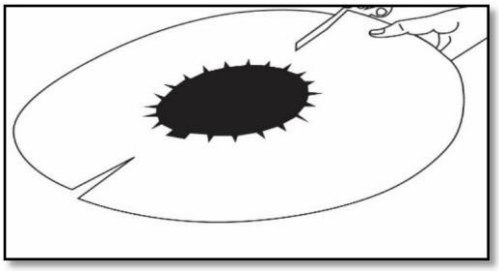


7.7 PLATFORM INSTALLATION OF RODENT GUARD (RG)

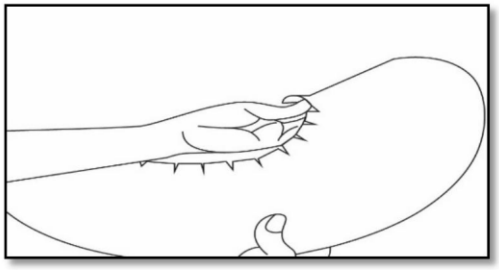
7.7.1. For protection against rodent attacks (one set contains 4 pieces of rodent guard):

a. One set can be installed on any platform legs with leg perimeter (round or square) of 22 cm (9") to 44 cm (17").

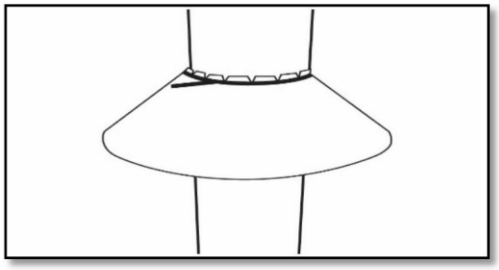
b. If the leg area is smaller, the rodent guard can be optionally cut in half to fit. Cut along the lines at the back of the rodent guard.



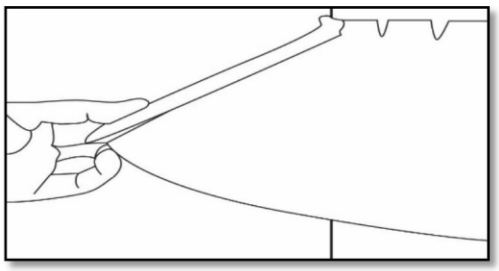
7.7.2. Fold the rodent guard's teeth upwards against the sides of the leg to keep itfrom slipping.



7.7.3. Make sure to overlap the sides at least one inch.



7.7.4. Lock the overlap using staple wire, cable wire, or any fastener.



7.8 TERMITE CONTROL

7.8.1. Overview of Termite.

a. The two most common types of termites are "dry wood" and "ground," or subterranean termites.

b. Termites need moisture to survive and will die if exposed to sunlight or open air for more than a few minutes. Their tunnels protect them from the elements.

c. High moisture areas like basements and crawl spaces are very attractive to termites and can serve as starting points for an infestation.

7.8.2. Description (Subterranean Termite).

a. Food and moisture:
   - Need a great deal of moisture such as from soil, and damp wood, Cellulose (from wood) is their diet.

b. Habitat:
   - Usually they live in the soil but can be above ground if enough moisture is present. They have large colonies.

c. Evidence of activity:
   - Protective mud tubes ascending from the ground to the structure or protruding from walls, etc.

d. Prevention:
   - Treat the soil before construction - pretreatment with termiticide.
   - For more information go to Chemical soil treatment.
   - A termite bait station monitoring system to monitor termite activity and bait placements after detection.
   - Regular inspections.

e. Control Measures:
   - With current activity use a baiting program or a termite barrier treatment.

7.8.3. Termite Treatments.

a. The traditional method of controlling subterranean termites was to apply a liquid pesticide, known as a termiticide, to the soil. This chemical treatment relied on the application of a chemical barrier around and beneath the structure designed to block all possible routes of termite entry. Any termites attempting to penetrate through the treated soil were either killed or repelled.

b. There are several different insecticides currently used by pest control operators for termite soil treatments. All of them are safe and effective when used per label directions. Theinsecticides remain effective in the soil for approximately 5 to 10 years.

c. Effective termite treatments require a great volume of termiticide.

7.9 RECYCLING

GrainPro® G-HF Cocoon™ Lite is made of PE.

7.9.1. The products can be delivered to the nearest recycling facilities in the area.

7.9.2. Plastic #4 – Low Density Polyethylene can be recycled into compost bins, panneling, trash can liners and cans, floor tiles, and shipping envelopes.

8. FREQUENTLY ASKED QUESTIONS AND ANSWERS

8.1. SHOULD I PUMP THE AIR OUT OF THE G-HF COCOON LITE?

- If used as simple G-HF Cocoon Lite™, do not pump out or modify the air inside. The insects own natural activity (respiration) will use up the available oxygen and convert themto carbon dioxide (CO_2).

8.2. SHOULD I FUMIGATE INFESTED FOOD BEFORE STORAGE?

- No, you do not need to fumigate to get rid of the infestation. The insects will die in a matter of days due to lack of oxygen.

8.3. IS THERE ANY USE NOT RECOMMENDED FOR G-HF COCOON LITE?

- Yes, the G-HF Cocoon Lite™ is not recommended for storing fresh fruits, vegetables, medicine, or insufficiently dried commodities.

8.4. CAN YOU ADD OR TAKE OUT ITEMS ONCE THE G-HF COCOON LITE IS FILLED AND CLOSED?

- Yes, you can take out or add items. If the added items are infested, the insects will naturally die when oxygen is used up. However, it is not recommended to frequently openthe G-HF Cocoon Lite™. The GrainSafe Bag-1.0™ with a 1-ton capacity can be used instead.

8.5. DO I NEED TO FILL G-HF COCOON LITE ENTIRELY FOR IT TO BE HERMETIC?

- No. However, at least a three-quarter load is recommended to ensure a good hermetic effect and full protection from insect infestations and rodents.

8.6. SHOULD THE G-HF COCOON LITE BE INSTALLED ONLY INDOORS?

- No. The G-HF Cocoon Lite™ is designed for indoor and outdoor use also under all climatic conditions.

8.7. WILL A PUNCTURE NEGATE THE BENEFITS OF HERMETIC STORAGE IN THE G-HF COCOON LITE?

- Not completely, although a puncture allows oxygen to maintain an infestation in the immediate area of the punctured hole. Tight bag stacking of the stored product tends to prevent widespread infestation. Immediate repair of all punctures or cuts is highly recommended.

8.8. WHAT IS THE SAFE PRODUCT MOISTURE CONTENT FOR STORAGE IN G-HF COCOON LITE?

- The G-HF Cocoon Lite™ works best with grains at or below the equilibrium moisture content which varies with locations and weather conditions. Equilibrium moisture content is affected by temperature and relative humidity.

8.9. CAN RODENTS BITE THROUGH THE PE MATERIAL OF AN INSTALLED G-HF COCOON LITE?

- Yes, but only if the sides are sagging (not stretched firmly). Rodents penetrate the smooth, slippery surface of a G-HF Cocoon Lite™ if the sides have too little tension. Rodents can also damage the top cover by jumping down from an overhang such as a low hanging branch of a tree. In areas with heavy soils and high rodent activity, it is recommended that the G-HF Cocoon Lite™ be placed on a 5-centimeter-thick layer of sand. But concrete or paved flooring is best. WARNING: Be sure to protect the empty G-HF Cocoon Lite™ in its carry bag during storage. Rodents can damage G-HF Cocoon Lite™ when they are empty and left unprotected.

8.10. CAN G-HF COCOON LITE BE USED TO STORE AGRICULTURAL COMMODITIES OTHER THAN GRAINS?

- Yes, most dry agricultural commodities such as seeds, pulses, beans, coffee, cocoa, some dried fruits, and even dried chilies can be safely stored. When in doubt, ask GrainPro®.

8.11. HOW FAST WILL OXYGEN LEVEL DROP AFTER SEALING?

- Normally, if the stored commodity is sufficiently dried and heavily infested, except for coffee, oxygen can drop down to 1-2% in 14 days. The drop depends on infestation level, moisture content of the product, and other factors. If the oxygen level does not drop in aspan of 7 days, check for open zipper track; inspect the top and bottom sections for holes and cuts. Contact GrainPro® for assistance immediately.

8.12. WHAT SHOULD BE DONE WHEN IT IS DIFFICULT TO TAKE AN OXYGEN READING?

- First, check the flexible inlet valve and see if it is clogged or dirty. Clean the inlet to remove dirt and other impurities. Slightly flex the end of the flexible inlet valve to create an opening for air to pass through. When inserting the oxygen analyzer tube, slightly pinch the flexible inlet to get a proper reading. Refer to the Oxygen Analyzer Manual for further information.

8.13. IS IT SAFE FOR THE HUMIDITY INDICATOR TO COME IN CONTACT WITH FOOD?

- The GrainPro® humidity indicators are non-toxic.

8.14. SHOULD I REPLACE THE HUMIDITY INDICATOR IF THEY CHANGE COLOR?

- No. Humidity indicator will only change its color from blue to pink when relative humidity is above 65% and vice versa. However, it is recommended that indicator be replaced every 6 months, as they may not be as effective after some time.

8.15. HOW LONG WILL IT TAKE FOR THE HUMIDITY INDICATOR TO CHANGE COLOR?

- Normally, the indicators will change color within minutes of exposure to the ambient conditions. However, the time it takes for the humidity indicator to turn from one color to another depends on the amount of humidity the indicator is exposed to and the temperature.

9. WARRANTY CLAUSE

GrainPro® hereby warrants that Products sold by it to Buyer shall be free of defects in workmanship, including maintaining gas tightness for a period as follows - starting from the date of shipment (B/L): Two years for the G-HF Cocoon Lite™ liner and zipper. One year for all other parts.

The warranty liability is limited to replacement of defective Products the warranty period at GrainPro's plant in accordance with the provisions specifically and expressly set forth herein.

The Buyer will pay for Products which need to be replaced under warranty, a percentage of the full list price according to the ratio between the period, which has passed until replacement, and the full warranty period.

The Buyer shall bear shipping costs for shipment of defective Products to GrainPro, and GrainPro shall bear shipping costs of returning good Products to Buyer.

The Warranty does not cover the cost of any services, work, or materials required for the replacement of defective Products with good Products at the site of installation.

GrainPro shall have no obligation under the warranty to replace defective Products or parts thereof if the defect is a result of any of the following: normal wear and tear; damages occurring after delivery, accidents, acts of God, or catastrophes, fault or negligence, or improper storage installation, maintenance of the Products.

Replacement costs and shipping charges for Products found not to be under warranty as specified above would be paid in full by the Buyer before new/refurbished Products are shipped to.

Notwithstanding the above, if the Products include main parts or sub-assemblies purchased byGrainPro from other vendors ("Additional Equipment"), then the period and terms of warranty for Additional Equipment are limited to the period and terms offered by the vendors of such equipment.

The Buyer agrees that the warranty liabilities of GrainPro shall be and are limited to the express foregoing terms: THE EXPRESS WARRANTIES AND OBLIGATIONS SET FORTH ABOVE, ARE AND SHALL BE IN LIEU OF ALL OTHER WARRANTIES AND OBLIGATIONS OF GRAINPRO, AND EXPRESSED OR IMPLIED. EXCEPT TO THE EXTENT HEREIN PROVIDED, GRAINPRO DOES NOT MAKE AND SHALL NOT BE DEEMED TO MAKE ANY WARRANTY WHATSOEVER TO THE, TO ANY END USER OR TO ANY OTHER PERSON OR PARTY, INCLUDING, WITHOUT LIMITATION, ANY WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR ANY PARTICULAR USE OR PURPOSE. GRAINPRO SHALL NOT BE LIABLE FOR ANY LOSS OF USE, SALES OR PROFIT OR FOR ANY INDIRECT, CONSEQUENTIAL OR INCIDENTAL DAMAGES CAUSED BY OR SUFFERED AS A RESULT OF THE SALE OR USE OF THE PRODUCTS.

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