

GRAINPRO® SELF-VERIFYING COCOON™

INSTRUCTION MANUAL

MA2004LN0500-22



“A GREEN, NOT ONLY FOR
PROFIT COMPANY”



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TABLE OF CONTENTS

1. INTRODUCTION.....	4
2. CHECKLIST	5
3. COMPONENTS	6
4. SPECIFICATIONS	7
5. INSTALLATION.....	7
Site selection.....	7
Loading	8
Positioning the top section	9
Use of Desiccant (Calcium Chloride, CaCl ₂) - (Recommended)	9
Zipping	10
Pressure decay testing (PDT).....	11
Use of Security Tape - (Optional).....	12
Tensioning of straps.....	13
Using oxygen analyzer for monitoring	13
Using carbon dioxide analyzer for monitoring	13
Monitoring Relative Humidity (%RH)	14
Dismantling and unloading	15
6. PREVENTING CONDENSATION.....	15
Why does condensation occur.....	15
Moisture content (MC) requirement for safe storage	15
Setting-up the GrainShade (Outdoor Installation)	15
7. MAINTENANCE AND CARE	16
Regular examination	16
Physical inspection	16
Repairing punctures and other damages.....	17
Prohibited items for air shipment	17
Cleaning top and bottom sections	17
Folding	17
Safekeeping	18
Platform installation of rodent guard (RG)	18
Termite control	19
Recycling	19
8. FREQUENTLY ASKED QUESTIONS	20
9. WARRANTY CLAUSE	21

1. INTRODUCTION

GrainPro® Self-Verifying Cocoon™ (SVC) is a flood protected, Ultra-Hermetic™ gas-tight storage container designed for organic-use and long-term storage of agricultural commodities. It is made of flexible UV-resistant Polyvinyl Chloride that is resistant to rodents and has low permeability to oxygen (O₂), carbon dioxide (CO₂) and moisture. It also includes a transparent plug to monitor the relative humidity (RH) inside the SVC.

SVC is able to withstand floods below the zipper line and can maintain the gas resulting from the respiration of insects and commodity; low oxygen and high carbon dioxide levels will control infestation and mold growth.

1.1. FEATURES:

- 1.1.1. Preserves grain quality for long periods of storage
- 1.1.2. Moisture level of the commodity remains constant
- 1.1.3. The product can be stored at ambient temperature instead of energy consuming cold storage
- 1.1.4. Installation demands little infrastructure
- 1.1.5. Weather-resistant and UV-protected (could be used indoors or outdoors)
- 1.1.6. Inhibits mold growth and aflatoxin production
- 1.1.7. Controls pests and insects
- 1.1.8. Allows users to check oxygen and relative humidity levels
- 1.1.9. Easy to maintain and repair
- 1.1.10. A “green” technology for organic product storage (certified safe for organic use).

1.2. PRODUCT GUARANTEE:

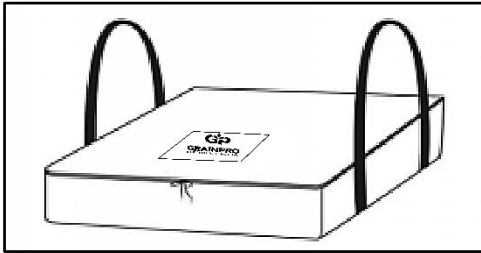
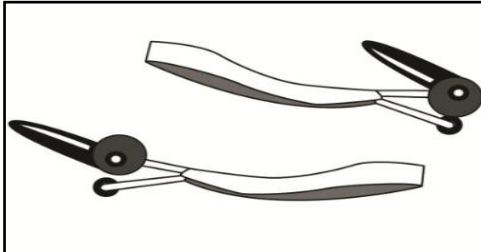
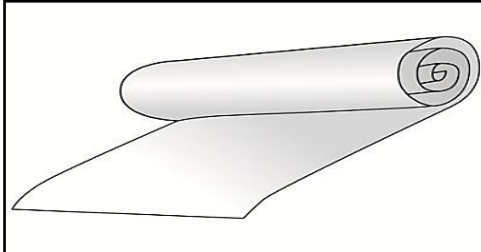
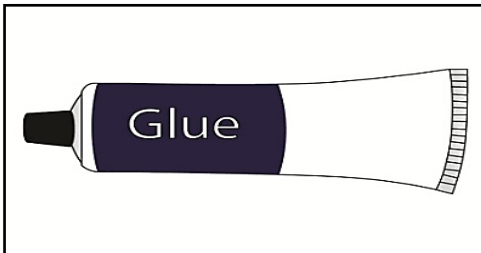

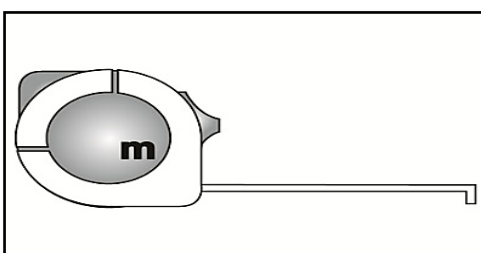
- 1.2.1. In accordance with the terms and conditions herewith, GrainPro® Inc. fully guarantees the quality of this product provided it is used according to the instructions in this manual.
- 1.2.2. Please read and understand the manual thoroughly before using the S-VC.

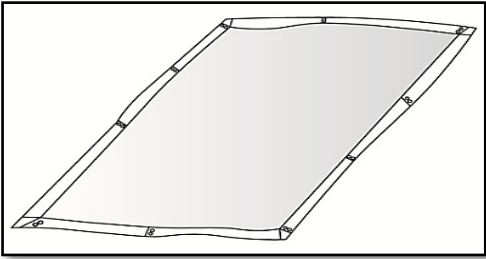
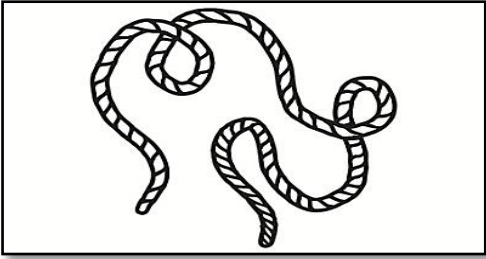
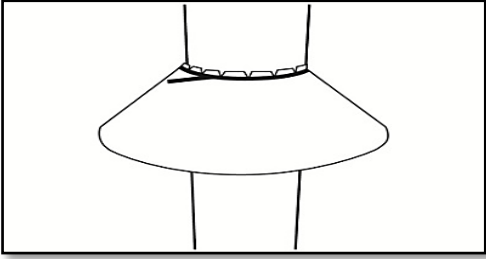
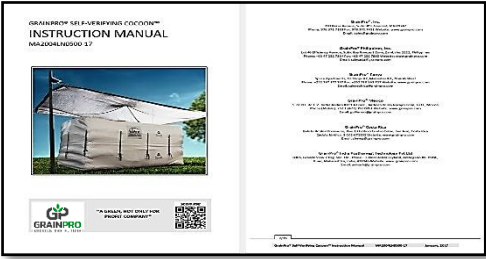
1.3. COMMENTS, COMPLAINTS, AND/OR CLARIFICATIONS:

- 1.3.1. Please contact customercare@grainpro.com.
- 1.3.2. We shall be glad to answer any of your questions.

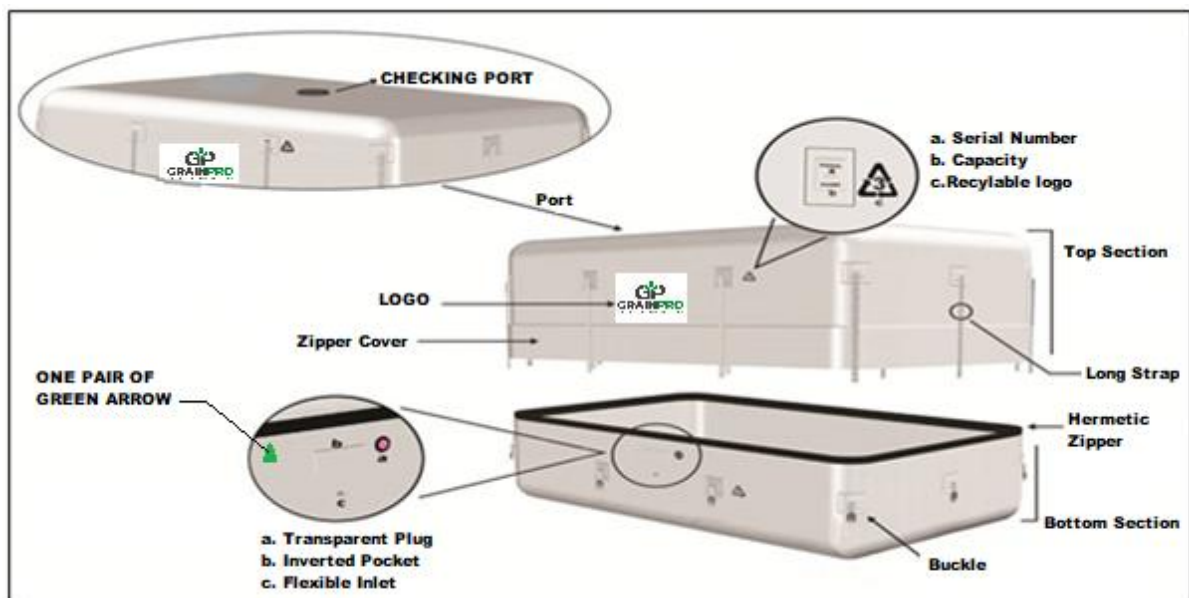
2. CHECKLIST

Please inspect your GrainPro S-VC to ensure that the package includes the following items:

PART NAME	DESCRIPTION	IMAGE
2.1. CARRY BAG	2.1.1. Contents: SVC (Top and Bottom) GrainShade™ Small parts Repair kit Instruction Manual	
2.2. ZIPPER PULLS	2.2.1. For zipper sealing. One (1) set (Left and Right)	
2.3. PATCHING MATERIAL	2.3.1. White-colored PVC roll for patching holes, or other damages One (1) pc (30cmx1.5m)	
2.4. GLUE	2.4.1. For patching PVC materials. One (1) tube	
2.5. SILICON SPRAY	2.5.1. For zipper lubrication One (1) can (for 5-150MT) Two (2) cans (for 300MT & above)	
2.6. TAPE MEASURE	2.6.1. For checking height of stack One (1) piece	

2.7. GRAINSHADE™	2.7.1. For outdoor installation One (1) piece	
2.8. EXTRA ROPE	2.8.1. For tying the GrainShade™ Ten (10) meters long (minimum)	
2.9. RODENT GUARD	2.9.1. For platform posts to prevent rodent access during safekeeping of empty SVC. 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 2.10.4. Warranty clause	

3. COMPONENTS



4. SPECIFICATIONS

4.1. MATERIALS

PARAMETERS	STANDARD
Material	Polyvinyl Chloride
Color	White
Thickness, cm (inch)	0.83 (0.033) \pm 7%
Weight, g/m ²	1,050
OTR, cc/m ² /day	<500
WVTR, g/m ² /day	<9
Sealing mechanism	PVC Hermetic Zipper
Product Life, years	15
Warranty, years	5

4.2. PRODUCTS

S-VC	CAPACITY (MT)*	LENGTH cm (inch)	WIDTH cm (inch)	HEIGHT cm (inch)	VOLUME m ³ (ft ³)
GPS-VC -005	5	298 (117)	165 (65)	150 (59)	7.4 (260)
GPS-VC -010	10	330 (130)	298 (117)	150 (59)	14.7 (520)
GPS-VC -020	20	389 (153)	380 (150)	200 (79)	30.2 (1,067)
GPS-VC -2-050	50	890 (350)	440 (173)	200 (79)	78.3 (2,765)
GPS-VC -3-050	50	595 (234)	435 (171)	300 (118)	77.7 (2,742)
GPS-VC -100	100	860 (339)	580 (228)	300 (118)	149.6 (5,284)
GPS-VC -3-150	150	890 (350)	850 (335)	300 (118)	226.9 (8,014)
GPS-VC -4.5-150	150	750 (295)	680 (268)	450 (177)	229.5 (8,014)
GPS-VC -300	300	926 (365)	745 (293)	598 (235)	413.9 (14,617)

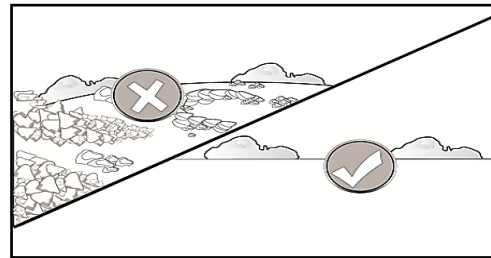
*Based on wheat bulk density

5. INSTALLATION

5.1. SITE SELECTION

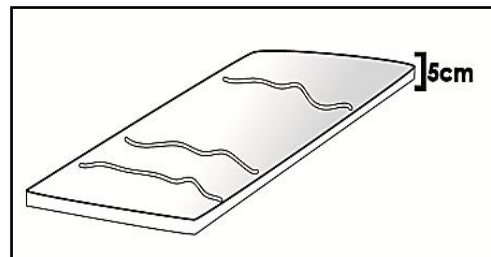
5.1.1. In selecting a site, look for:

- S-VC is designed for both indoor and outdoor installations.
- A smooth area away from standing or running water.
- Ensure that the site is protected from stray animals and from theft.
- Install GrainShade™ to avoid condensation due to temperature difference during day time and night time.



5.1.2. Prepare the selected site by clearing away all sharp objects (stones, broken glass, nails, etc.) that may puncture the S-VC. Provide sufficient area to accommodate the S-VC and space for inspection (at least 50 cm each side).

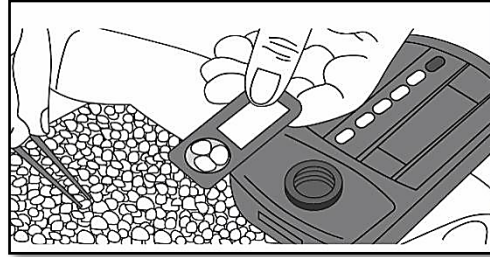
5.1.3. If ground will be used as flooring, put a layer (5cm) of fine sand (or any equivalent) on top of the soil as ground foundation.



5.1.4. During loading, make sure that workers do not wear shoes with spikes that may damage the S-VC. Preferably, choose a site that allows ease of loading/unloading, away from crowded areas and rubbish sites. For indoor installation, clear the area to remove sharp objects.

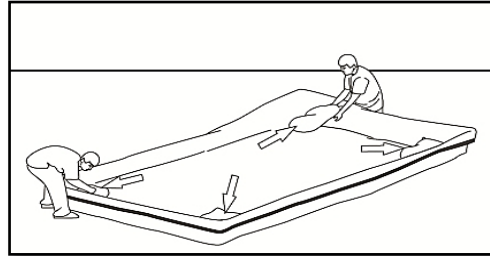
5.2. LOADING

5.2.1. Check the moisture content of the commodity to ensure that commodity is at safe MC for storage.



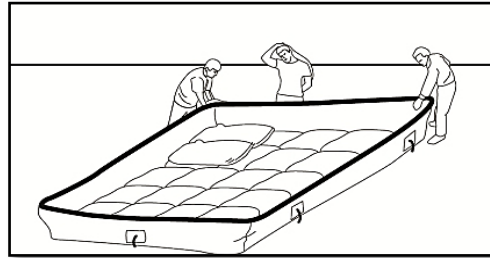
5.2.2. Loading the bottom section:

- Unfold the bottom section of the Cocoon and lay it out on the prepared site.
- Start piling the sacks on the bottom section.
- Put down the first four bags each on every corner of the S-VC.
- 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:

- Load the first layer of sacks in one direction.
- Continue adding layers in an interlocking manner (crisscross), i.e. one layer on the top of the previous layer.
- Stack sacks to the corresponding height of the Cocoon.

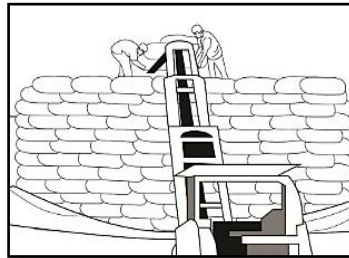


5.2.4. Mechanical loading of bagged commodity, optional for big sizes S-VC:

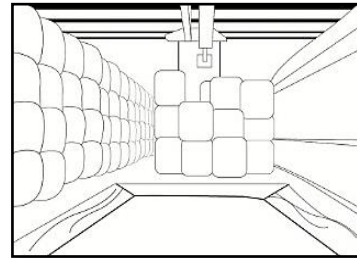
- Stacking of grains can be accomplished by using conveyor, forklift or crane.
- Continuous stacking must be done especially for outdoor installation. Avoid delays.



Conveyor



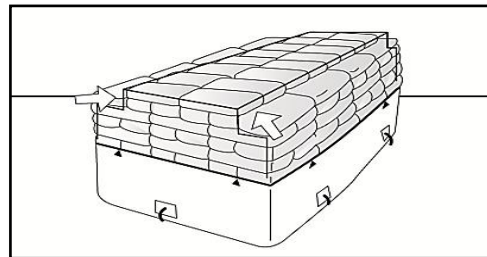
Forklift



Crane

5.2.5. The top layer:

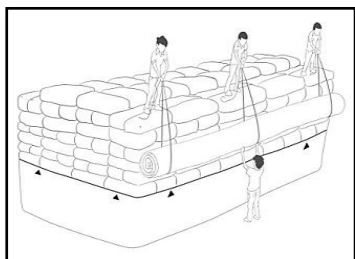
- Continue piling the sacks until the desired S-VC height is reached.
- Provide one line of sacks in the middle along the longitude of the stack once the required stacking height has been reached. This will create a crest that will keep rainwater from accumulating on top of the S-VC.



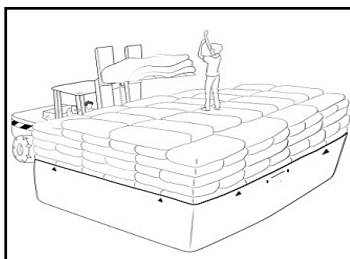
5.3. POSITIONING THE TOP SECTION

5.3.1. Place top section of the Cocoon using the following:

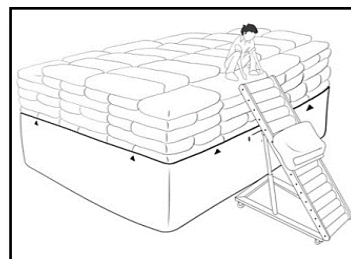
- By manual rolling
- Using forklift or conveyor



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 located outside.

5.3.3. One pair of arrows is painted green. Match these arrows for correct front and back orientation of the Cocoon.

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

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

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

Desiccants are commonly used to protect goods against moisture damage. Hygroscopic commodity, such as cocoa, coffee, and various nuts and grains, are particularly susceptible to mold and rot when exposed to condensation and humidity.

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

5.4.1. Required dosage of Calcium Chloride, CaCl_2 .

SVC	CAPACITY	Desiccant Required (CaCl_2) for 1month of Storage	Desiccant Required (CaCl_2) for 6mos. of Storage
	(MT)	grams	grams
GP S-VC -005	5	50	300
GP S-VC -010	10	100	600
GP S-VC -020	20	200	1200
GPS-VC -2-050	50	600	3600
GP S-VC -3-050	50	600	3600
GP S-VC -100	100	1000	6000
GP S-VC -3-150	150	1600	9600
GP S-VC -4.5-150	150	1600	9600
GP S-VC -300	300	3000	18000

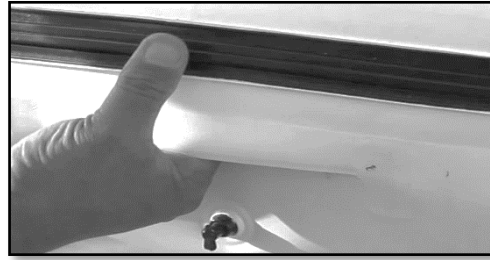
5.4.2. Place the desiccant packs (Calcium Chloride, CaCl_2) on the middle-top portion of the stack inside the SVC before zipping.

5.4.3. If six (6) months of storage, spread-out the desiccant packs (Calcium Chloride, CaCl_2) on top portion of the bags inside the SVC before zipping.

5.5. ZIPPING

5.5.1. Preparing to zip:

- Insert one hand inside the inverted pocket and engage the zipper track of the top and bottom liners by pressing the zipper.
- Manually close the zipper track to a length of 10cm before using the zipper pull.

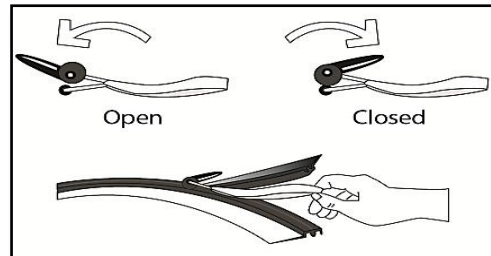


NOTE:

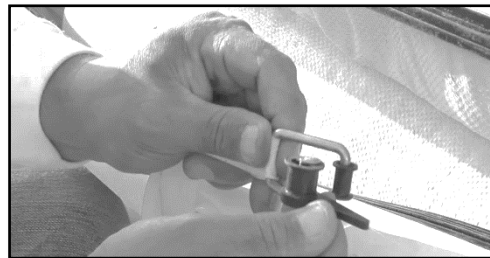
- Zipper pulls are designed to zip either to the right [marked with "RIGHT"] or to the left [marked with "LEFT"] directions.

5.5.2. Engaging the zipper pull:

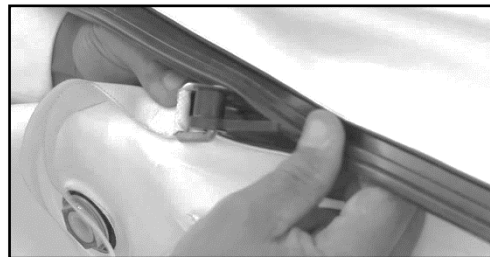
- Open the zipper pull by moving the black plastic handle with the large wheel opposite to the flexible pulling loop.



- Starting with the inverted pocket, place the smaller black running wheel inside the liner facing downward to engage the zipper track of the bottom section of the Cocoon.

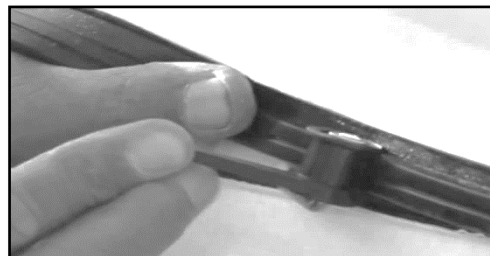


- Place the larger wheel outside the liner facing upward to engage the zipper track of the top section of the Cocoon.



5.5.3. Using the zipper pull:

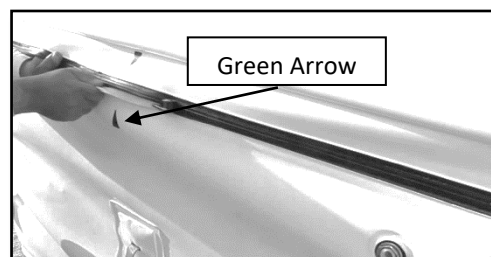
- Rotate the zipper pull's plastic handle 180° toward its pulling loop to lock the zipper tracks. Slide the zipper pull around the S-VC.



- Sealing the rest of the zipper:

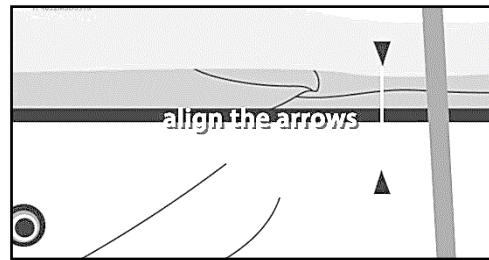
NOTES:

- To make zipping easier, a second person may pull the top and bottom zipper tracks closer.
- Apply the silicon spray to the zipper track for easier zipping.



5.5.4. Completing the zipping process:

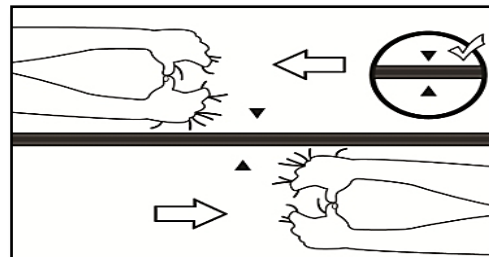
- a. Check marks ("arrows") printed on both top and bottom sections in pairs. The markings at the top section are located on the protective flap.



- b. If arrow pairs did not match, slide the zipped tracks by pulling the top and bottom liners in opposite directions until the marks meet.

NOTE:

- If marks were not aligned, the zippers may have been exposed to different temperatures resulting in elongation of the zipper. Both sections may be exposed under the sun to remove difference in length.

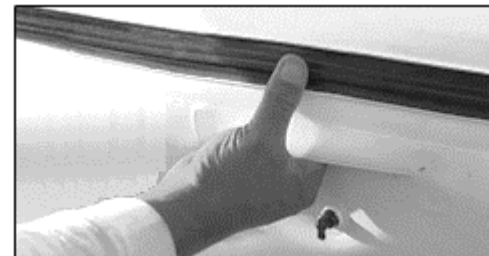


5.5.5. Removing the zipper pull:

- a. Complete sealing process at the inverted pocket. Take the zipper pull off the track by rotating the plastic handle.



- b. Manually close the last few centimeters of the zipper track by inserting one hand into the inverted pocket and supporting the back of the zipper, then pressing your thumb in the front zipper.

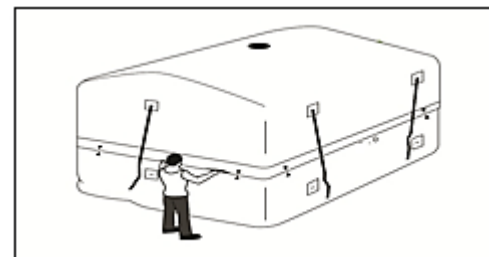


5.5.6. Checking the zipper:

- a. Check to ensure that entire length of the zipper track is fully closed.
- b. If not, press the zipper tracks by hand to seal.

NOTE:

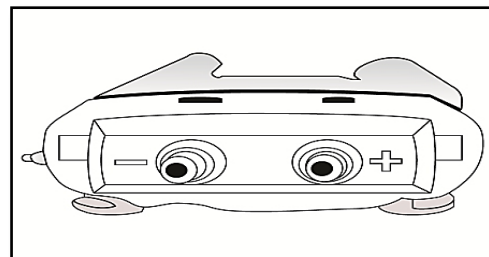
- Dirt or other objects on the zipper track can hinder sealing. Clean the zipper track prior to zipping.



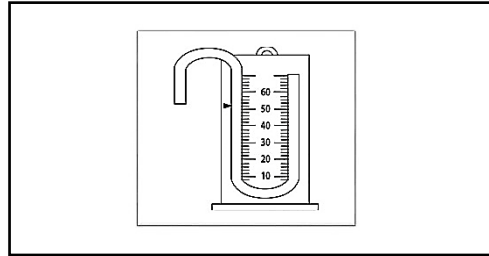
5.6. PRESSURE DECAY TEST (PDT)

- 5.6.1. After complete zipping, make sure that all the ports of the S-VC are closed. Perform a Pressure {Vacuum} Decay Test (PDT) to ensure gas-tightness.

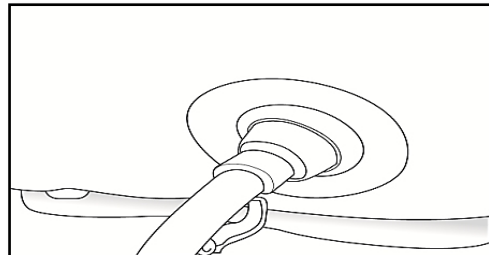
- a. Use digital manometer.



- b. Monitor pressure using commercially available or improvised U-tube manometer.

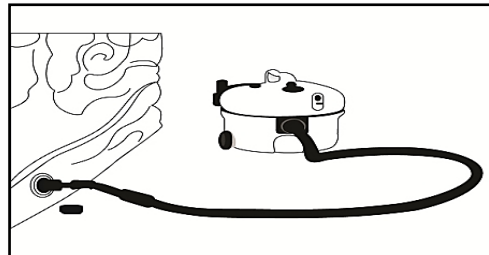


- 5.6.2. Connect the manometer hose into the flexible inlet of the S-VC.



- 5.6.3. Use vacuum pump [at least 600 Watts (0.80 horsepower)] to create negative pressure.

- a. Connect the vacuum pump to the S-VC inlet port.
- b. Create at least -250 Pascals (Pa) or -25 millimeters of water (-25 mm H₂O) vacuum. This process also allows the zipper tracks to properly engage as there may be imperfections during zipping.
- c. The test is considered passed if final pressure is not greater than half (50%) of the initial pressure (created by the vacuum pump) within five (5) minutes.
- d. If the PDT test failed, check for holes/tears, open ports or zipper opening. Then repeat PDT.

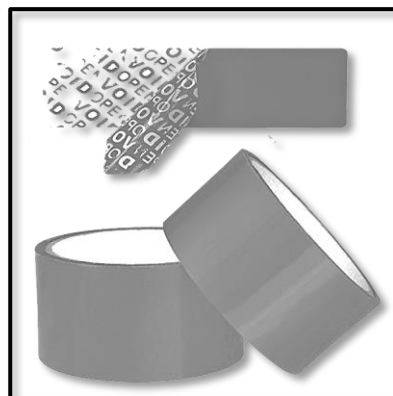


5.7. USE OF SECURITY TAPE - (OPTIONAL)

Note: Security Tape is not included in the package.

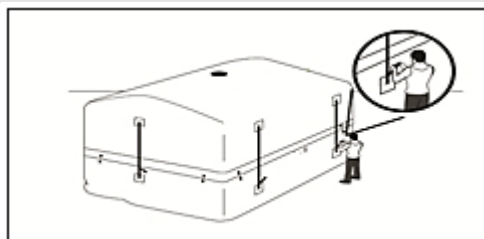
Security tapes are recommended to help us or our customers to identify if the Cocoon zipper has been deliberately opened, either because of improper closing, high forces.

- 5.7.1. After Pressure Decay Test (PDT), properly place security tape around the Cocoon's hermetic zipper.
- 5.7.2. If the Cocoon has been deliberately opened, prints in the tape will remain in the zipper area.

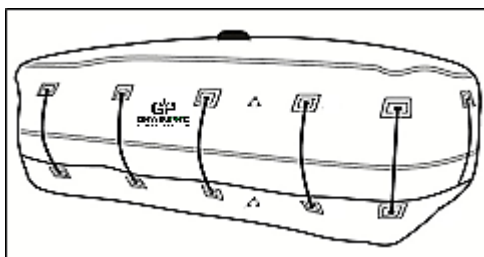


5.8. TENSIONING OF STRAPS

5.8.1. Cover the zipper by placing the protective flap over the zipper track. Tighten the straps to correct folds along the liner. This is to prevent damage due to rodent attacks.



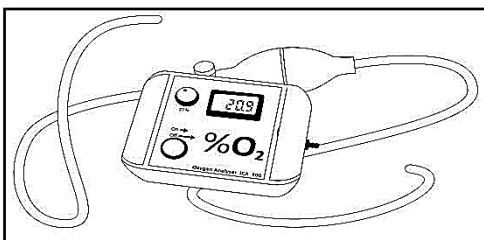
5.8.2. Attach cords to the buckles of the S-VC to develop tension. Required tension can be still achieved for Cocoons that are 75% full.



5.9. USING OXYGEN ANALYZER FOR MONITORING

5.9.1. Use of an oxygen analyzer:

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



b. Succeeding monitoring should be done twice a week. Normally, oxygen levels should drop 1-2% per day to an O₂ level less than 3% (though lower levels have been observed). Oxygen level may go up by a few percent but must not exceed 7%. Otherwise, sealing is probably compromised and the commodity may not be adequately protected.



5.10. USING CARBON DIOXIDE ANALYZER FOR MONITORING

The GrainPro CO₂ analyzer uses a non-dispersive infrared radiation (NDIR) sensor for the detection of carbon dioxide. When a sensor encounters a target gas, voltage signal is generated in proportion to the gas concentration. This voltage signal is amplified, digitized and displayed on the instrument's OLED display.

5.10.1. Using the carbon dioxide analyzer:

a. During the first 15 days of installation, carbon dioxide level should be checked daily using the CO₂ analyzer.



- b. Succeeding monitoring should be done twice a week. Carbon dioxide levels should increase to a level greater than 10%. Carbon dioxide level may go up to 15% or more. When decrease in CO₂ level is observed, sealing is probably compromised and the commodity may not be adequately protected.

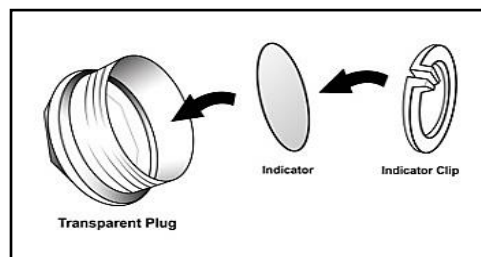


5.10.2. Monitoring of carbon dioxide level is recommended to ensure control of insect infestation. Details of using CO₂ analyzer is discussed in the analyzer's instruction manual.

5.11. MONITORING RELATIVE HUMIDITY (%RH)

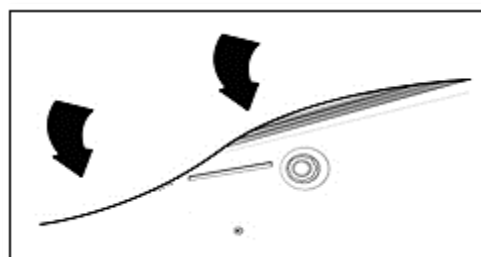
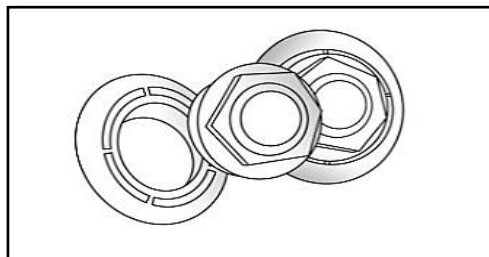
5.11.1. Use of humidity indicator:

- The humidity indicator is a special circular paper with moisture-sensitive chemical. Its color changes from blue to pink when relative humidity exceeds 65%.
- The humidity indicator provides an affordable and quick reference to relative humidity inside the S-VC.
- It is easy to use and does not require meticulous preparation for installation.
- The material is non-toxic and disposal doesn't need any special treatment.
- Procedures on how to use the humidity indicator:



Get a 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

Cover the humidity indicator with the zipper cover

5.11.2. Instructions when Indicator turned Pink:

- 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).
- Monitor the indicator for 4-8 hours.
- If the indicator turned pink within 4-8 hours, use other devices to check for the humidity inside or consult GrainPro.
- 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 (1 unit) of desiccant for 4-8 hours or oven dry for 10-20minutes, set the oven to 50°C (122°F).

5.12. DISMANTLING AND UNLOADING

- 5.12.1. Unzip the S-VC and wait until most of the CO₂ has been dispersed. Although CO₂ is not toxic, it is an asphyxiant.
- 5.12.2. Filling of S-VC progressively for several days could be done. Make sure that commodity is at safe moisture level.
- 5.12.3. Do not mix commodity from previous harvest with the newly harvested.
- 5.12.4. Unload commodity at the end of storage period.
 - a. Unfasten 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. Remove top cover.
 - d. Start to unload the sacks ('stairs' of sacks might make the job easier).

6. PREVENTING CONDENSATION

6.1. WHY DOES CONDENSATION OCCUR?

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 condense on the surface. Air movement inside the S-VC 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 S-VC rise and hit the cool S-VC top cover at dew point temperature, water condenses.

- 6.1.1. Avoiding trapping warm air inside the S-VC to prevent condensation at the top layer.
- 6.1.2. Install GrainShade to prevent heating up of air inside the S-VC by repelling solar radiation. Condensation can be checked manually by opening the sampling port located at the top. Close the port properly after checking.
- 6.1.3. Refer to 5.4 to prevent condensation using desiccant.

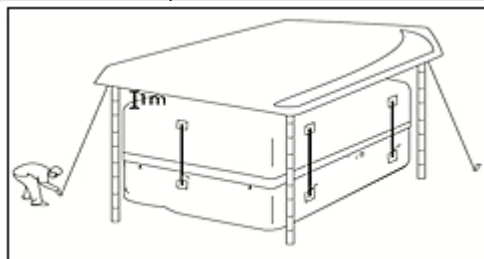
6.2. MOISTURE CONTENT (MC) REQUIREMENT FOR SAFE STORAGE

- 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. When the commodity is properly dried, microbial growth is inhibited due to absence of available water.
- 6.2.2. Maintain safe moisture of stored commodity by protecting dried product from ambient air (with high %RH) using hermetic 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 each corner and 1.0 meter higher than the S-VC.
- b. Tie corners of the GrainShade to the poles, maintaining at least 1-meter clearance between the top surface of S-VC and the GrainShade.
- c. Add wires to reinforce the pole by tying at the top and by placing pegs on the ground.



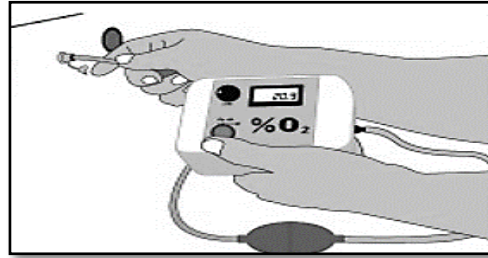
- 6.3.2. If poles are not feasible, tie the GrainShade to nearby posts, walls, tree branches, or pegs for support.
- 6.3.3. To prevent from sagging and flapping during rain and strong wind, install a wire or rope beneath and above the GrainShade.

7. MAINTENANCE AND CARE

7.1. REGULAR EXAMINATION

7.1.1. Measure oxygen concentration using Oxygen analyzer (GrainPro HH or ICA model). GrainPro carbon dioxide analyzer can be utilized also for monitoring CO₂ level.

- a. First-two weeks - daily.
- b. Succeeding days - twice a week.

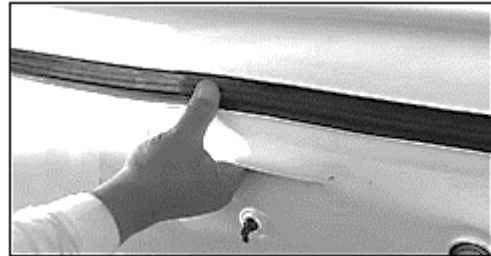


7.1.2. Check (at least weekly) for possible condensation by opening (and re-closing) the sampling port.

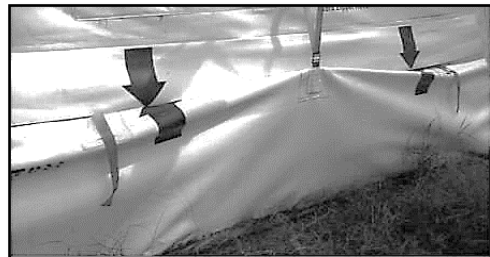


7.2. PHYSICAL INSPECTION

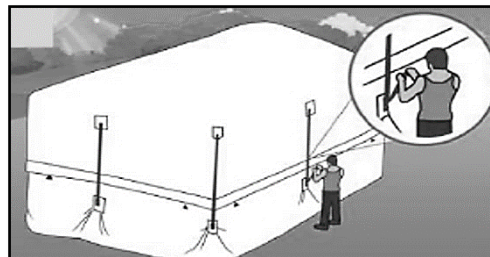
7.2.1. Check the zipper track for any small opening/s and push the track section by hand.



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



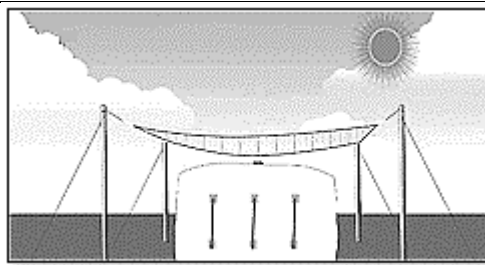
7.2.3. If slacks are observed, re-adjust the tension straps to pull any slack near the ground.



7.2.4. During rainy season, the upper surface of the S-VC should be regularly inspected for water accumulation and damage that would permit water to enter into the Cocoon. The stored commodity would be at risk if S-VC is not completely sealed.



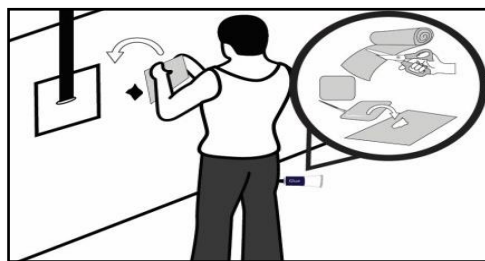
- 7.2.5. Re-tension wires to prevent sagging and flapping during rain and strong wind.



7.3. REPAIRING PUNCTURES AND OTHER DAMAGES

- 7.3.1. Use the patching material and adhesive found in the repair kit:

- Clean the area to be patched with a damp cloth or organic solvent.
- Apply glue (150-200g) on both surface with a brush or equivalent.
- Let it dry for 5-10 minutes. Stick patch and apply sufficient pressure.



- 7.3.2. Protective maintenance:

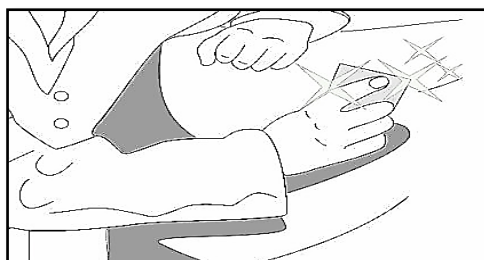
- Check the patched PVC occasionally and replace or re-patch if necessary.

7.4. PROHIBITED ITEMS FOR AIR SHIPMENT

- 7.4.1. The Silicone spray (for zipper lubrication) and Glue (for patching PVC materials) are not allowed to be shipped through air cargo.
- 7.4.2. These items will be removed from the package.
- 7.4.3. The client is advised to purchase equivalent product available locally.

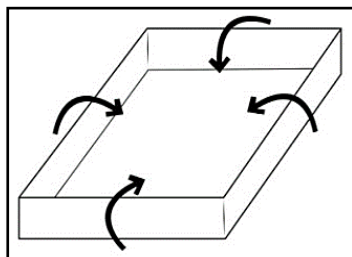
7.5. CLEANING TOP AND BOTTOM SECTIONS

- 7.5.1. Use liquid dishwashing soap and water.
- 7.5.2. Air dry or sun dry.

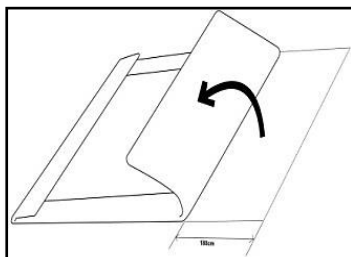


7.6. FOLDING

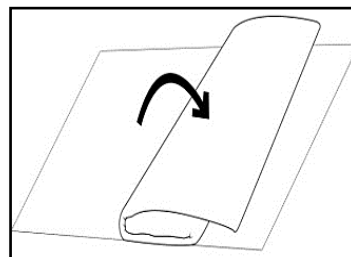
- 7.6.1. Measure 180cm from the end and fold.
- 7.6.2. Fold any extra material and finally fold in half.
- 7.6.3. Fold the material lengthwise until it fits in the carrying bag.



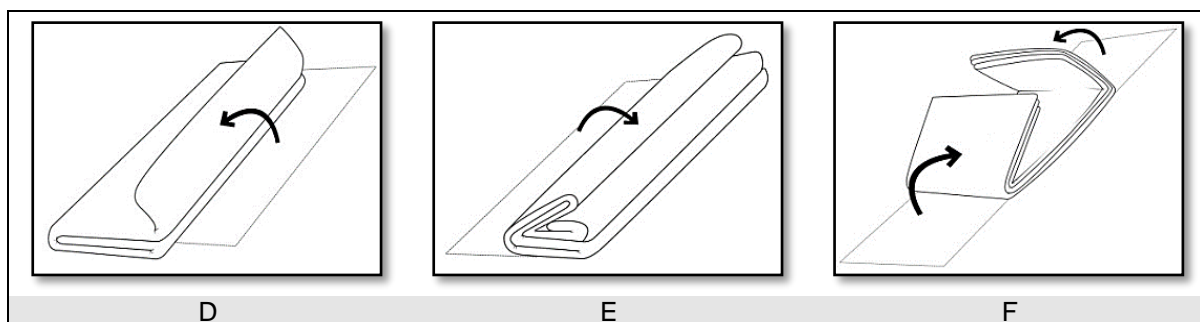
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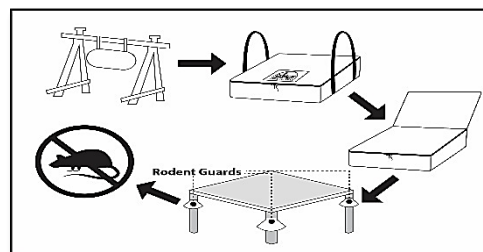
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7.7. SAFEKEEPING

7.7.1. The empty S-VC should be stored and protected from heat or direct sunlight and rodents.

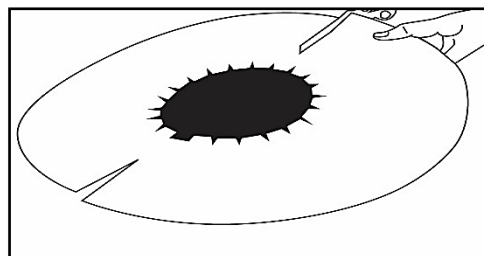
7.7.2. Do not place heavy object on top of the Cocoon as it may deform or may damage the liner.



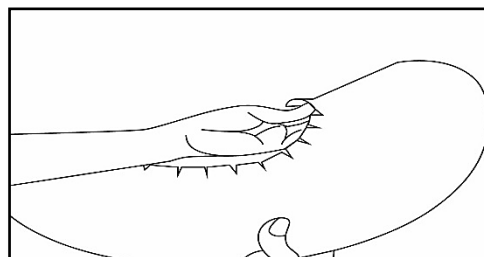
7.8. PLATFORM INSTALLATION OF RODENT GUARD (RG)

7.8.1. Install rodent guards to protect Cocoon against rodent attacks (one set contains 4 pieces):

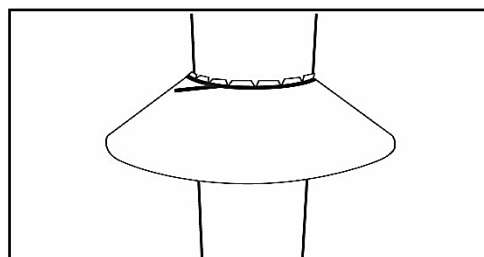
- One set can be installed on any platform legs with perimeter (round or square) of 22 cm (9") to 44 cm (17").
- If the leg area is smaller, guards can be cut in half to fit.



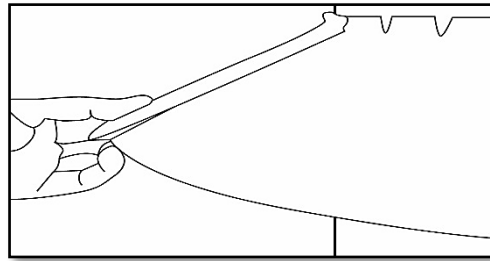
7.8.2. Fold the rodent guard's teeth upwards against the sides of the leg to keep it from slipping.



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



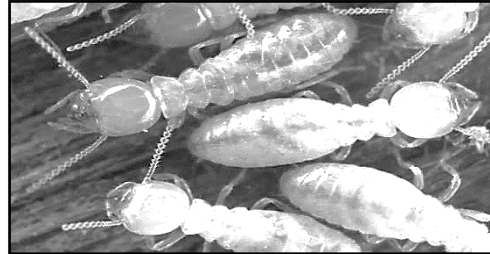
7.8.4. Lock the overlap using staple wire, cable wire, or any fastener.



7.9. TERMITE CONTROL

7.9.1. 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 these elements.



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

7.9.2. Description (Subterranean Termite)

- a. Food and moisture:
 - Need a great deal of moisture from soil or damp wood. Cellulose (from wood) is part of 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 using termiticide.
 - For more information search for 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.

7.9.3. 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. The insecticides remain effective in the soil for approximately 5 to 10 years.
- c. Effective termite treatments require a great volume of termiticide.

7.10. RECYCLING

GrainPro SV Cocoon is made of PVC.

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

7.10.2. Plastic #3 – PVC (Vinyl) can be recycled into paneling, flooring, speed bumps, decks or roadway gutters.

8. FREQUENTLY ASKED QUESTIONS

- 8.1. SHOULD I PUMP THE AIR OUT OF S-VC?
- If used as simple S-VC, do not pump out or modify the air inside. The insects own natural activity will use up the available oxygen and convert them to carbon dioxide (CO₂).
- 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 S-VC?
- Yes, the S-VC is not recommended for storing fresh fruits, vegetables, medicine, or insufficiently dried commodities.
- 8.4. CAN YOU ADD OR TAKE OUT ITEMS ONCE THE S-VC 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 open the S-VC. The GrainSafe Bag-1.0™ with a 1-ton capacity can be used instead.
- 8.5. DO I NEED TO FILL S-VC ENTIRELY FOR IT TO BE HERMETIC?
- No. However, at least 75% of the capacity is recommended to ensure full protection from insect infestation and rodents.
- 8.6. SHOULD THE S-VC BE INSTALLED ONLY INDOORS?
- No. The S-VC 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 S-VC?
- 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 S-VC?
- The S-VC works best with grains at safe 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 PVC MATERIAL OF INSTALLED S-VC?
- Yes, but only if the sides are sagging (not stretched firmly). Rodents penetrate the smooth, slippery surface of an S-VC 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 S-VC be placed on a 5-centimeter-thick layer of sand. But concrete or paved flooring is best. **WARNING:** Be sure to protect the empty S-VC in its carry bag during storage. Rodents can damage S-VC when they are empty and left unprotected.
- 8.10. CAN S-VC 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 a span 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 INDICATORS TO COME IN CONTACT WITH FOOD?
- The GrainPro humidity indicators are non-toxic.
- 8.14. SHOULD I REPLACE THE HUMIDITY INDICATORS IF THEY CHANGE COLOR?
- Yes. If the humidity indicator turned pink replace with an unused (blue) indicator. Please refer to 5.9.3. (Instruction when indicator turned pink) for step by step instructions.
- 8.15. HOW LONG WILL IT TAKE FOR THE HUMIDITY INDICATORS TO CHANGE COLOR?
- Normally, the indicators will change color within minutes of exposure to ambient conditions. However, the time it takes for the humidity indicator to turn from one color to another depends on %RH conditions.

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): Five years for the Self-Verifying Cocoon™ (S-VC™) 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 by GrainPro 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.

For further information and clarifications, visit our website at www.grainpro.com; email our Technical Support team: customer care@grainpro.com or call: +63 47 252 7884.