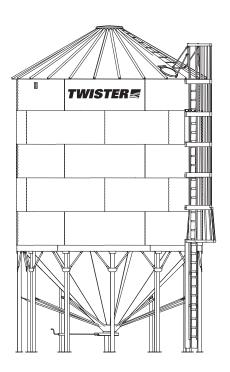


Farm Series Bin on Hopper (Twister Domestic)

Wide-Corr® Grain Bin Installation and Storage Instructions





Part Number: 198863 R15

Revised: January 2025

New in this Manual

The following changes have been made in this revision of the manual:

Description	Section	
Removed roof related contents	All sections	

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1. Introduction

Before assembling, please read this manual. Familiarize yourself with the process and the necessary precautions for efficient and safe assembly of this Twister Farm Series Bin on Hopper.

Everyone present at the assembly site is required to be familiar with all safety precautions.

Keep this manual available for frequent reference and review it with new personnel. Call your local distributor or dealer if you need assistance or additional information.

2. Safety

2.1. Safety Alert Symbol and Signal Words



This safety alert symbol indicates important safety messages in this manual. When you see this symbol, be alert to the possibility of injury or death, carefully read the message that follows, and inform others.

Signal Words: Note the use of the signal words **DANGER**, **WARNING**, **CAUTION**, and **NOTICE** with the safety messages. The appropriate signal word for each message has been selected using the definitions below as a guideline.

Indicates an imminently hazardous situation that, if not avoided, will result in serious injury or death.

⚠ WARNING

Indicates a hazardous situation that, if not avoided, could result in serious injury or death.

⚠ CAUTION

Indicates a hazardous situation that, if not avoided, may result in minor or moderate injury.

NOTICE

Indicates a potentially hazardous situation that, if not avoided, may result in property damage.

2.2. General Safety Information

Read and understand all safety instructions, safety decals, and manuals and follow them when assembling the equipment.

 Only experienced personnel who are familiar with this type of assembly and installation should perform this work. Untrained assemblers/installers expose themselves and bystanders to possible serious injury or death.



- Do not modify the grain bin in any way or deviate from the instructions in this manual without written
 permission from the manufacturer. Unauthorized modification or methods may impair the function and/or
 safety. Any unauthorized modification will void the warranty.
- Follow a health and safety program for your worksite. Contact your local occupational health and safety organization for information.
- Contact your local representative or Twister if you need assistance or additional information.
- Always follow applicable local codes and regulations.

2.3. Personal Protective Equipment

The following Personal Protective Equipment (PPE) should be worn when installing the equipment.

Safety Glasses



Wear safety glasses at all times to protect eyes from debris.

Coveralls



Wear coveralls to protect skin.

Hard Hat



Wear a hard hat to help protect your head.

Steel-Toe Boots



Wear steel-toe boots to protect feet from falling debris.

Work Gloves



Wear work gloves to protect your hands from sharp and rough edges.

2.4. Safety Equipment

The following safety equipment should be kept on site.

First-Aid Kit



Have a properly-stocked first-aid kit available for use should the need arise, and know how to use it.

2.5. Auxiliary Equipment Safety

Unapproved auxiliary equipment could cause performance issues or structural failure, and is not covered by warranty.

- Do not install auxiliary equipment if the grain bin is not designed for use with it. Refer to the specific information provided in this manual for auxiliary equipment or check with Twister or your dealer for written approval, if necessary.
- Obtain, read, and understand the instructions and safety warnings of the auxiliary equipment manufacturer.
- Attach auxiliary safety decals to the grain bin as applicable.
- Store auxiliary operations/maintenance manuals in a safe place available for future use.

2.6. Working At Height Safety

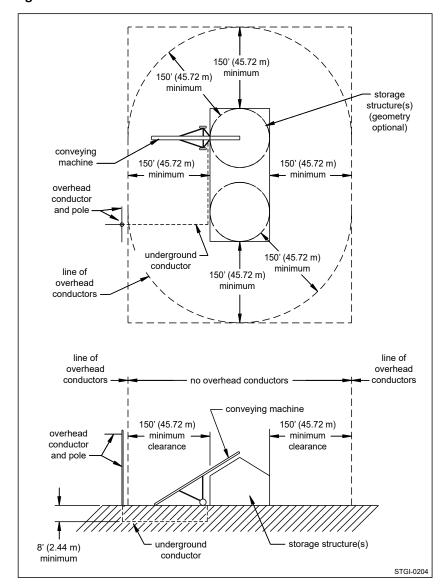
- Ensure that all work at height is properly planned, organized and carried out by a competent person.
- Use appropriate work equipment and make sure that they are inspected to ensure safety.
- Select collective measures to prevent falls (such as guard rails and working platforms) before other measures which may only reduce the distance and consequences of a fall (such as nets or air bags) or may only provide fall-arrest through personal protection equipment.
- Ensure that those persons working at height are trained in how to avoid falling and how to avoid or minimise any injuries should they fall.
- Check the weather condition. Postpone any work at height until there is no risk to the health and safety of any person working at height.
- Ensure that nothing is thrown or tipped from height if it is likely to injure a person.

2.7. Overhead Power Lines

MARNING

- Keep grain bins a horizontal distance of at least 150 ft (45.7 m) from power lines. Increase distance to meet electrical code requirements where required.
- Do not load or unload the grain bin if there is a chance of any loading or unloading equipment contacting power lines.
- Do not locate grain bins on both sides of a power line or under a power line.
- Electrocution can occur without direct contact.

Figure 1. Power Lines and Conductor Clearance





2.8. Safety Decals

- Keep safety decals clean and legible at all times.
- Replace safety decals that are missing or have become illegible. See decal location figures that follow.
- Replaced parts must display the same decal(s) as the original part.
- Replacement safety decals are available free of charge from your distributor, dealer, or factory as applicable.

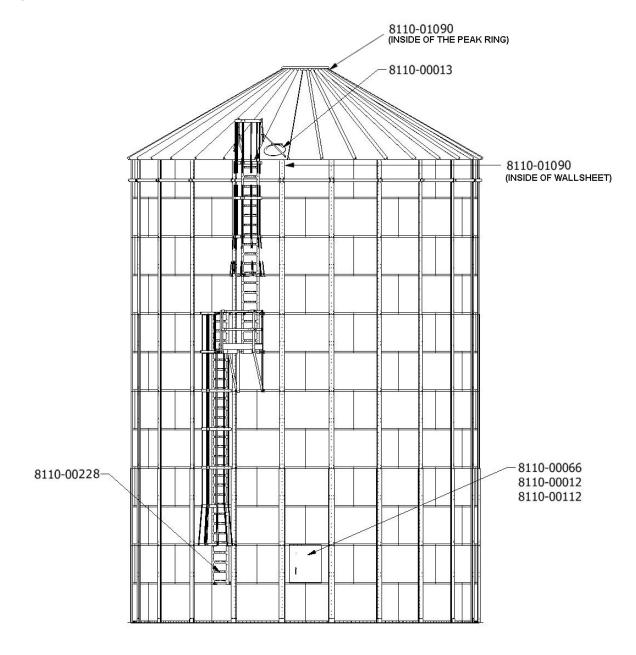
2.9. Decal Installation/Replacement

- 1. Decal area must be clean and dry, with a temperature above 50°F (10°C).
- 2. Decide on the exact position before you remove the backing paper.
- 3. Align the decal over the specified area and carefully press the small portion with the exposed sticky backing in place.
- 4. Slowly peel back the remaining paper and carefully smooth the remaining portion of the decal in place.
- 5. Small air pockets can be pierced with a pin and smoothed out using the decal backing paper.

2.10. Safety Decal Locations and Details

Replicas of the safety decals that are attached to the grain bin and their messages are shown in the figure(s) that follow. Safe operation and use of the grain bin requires that you familiarize yourself with the various safety decals and the areas or particular functions that the decals apply to, as well as the safety precautions that must be taken to avoid serious injury, death, or damage.

Safety Decal Locations



Safety Decals and Part Numbers

8110-00013

WARNING

ENTRAPMENT HAZARD

Never enter the bin when loading or unloading grain.

- 1. Shut off and lock out all power
- 2. Use a lifeline, safety harness, and have an observer outside before entering the bin.
- 3. Wear proper breathing equipment or a respirator.
- 4. Avoid the center of the bin.

Failure to heed these warnings could result in serious injury or death.

8110-00112





Keep clear of all augers, DO NOT ENTER this bin!

- If you must enter the bin

- Failure to heed these warnings could result in serious injury or death

1. Shut off and lock out all power. 2. Use a safety harness and safety line. 3. Station another person outside the bin. 4. Avoid the center of the bin. 5. Wear proper breathing equipment or respirator.

8110-00012



SAFETY INSTRUCTIONS

- Read operator's manual and all safety decals before assembling, using, or servicing bin.
- Close/latch all access doors when not in use.
- · Do not alter or modify bin structure
- Replace any damaged components only with factory made components.
- This bin should only be used to store free flowing, granular material, unless specifically designed and marked otherwise.
- · When filling, use top filler cap and direct material to center of bin.
- · Do not over-fill bin. Material should not be in contact with or place pressure on roof sheets.
- · Unload grain only from the center of the bin. If equipped with an approved binsweep or sidedraw, refer to its instructions for proper use.

8110-00228

NARNING

FALLING HAZARD

To prevent serious injury or death:

- · Do not climb ladder if damaged, wet, icy, greasy, or slippery.
- Maintain good balance by having at least three points of contact at all times. Face the ladder while climbing.
- Safe working load is 350 lb (160 kg). Do not overload.
- · Do not carry items while climbing.

8110-00066

NOTICE

When equipped with aeration system, to prevent roof and/or bin damage:

- Use a minimum 1 square foot (0.1m²) opening for each 1000ft³/min (30m³/min) of air.
- Ensure all roof vents are open and unobstructed.
- · Discontinue use of aeration fan if roof vents become obstructed with ice.

8110-01090



3. Before You Begin

3.1. Bin Design and Capacity

Standard Twister Grain Bins are designed for:

- 1. Non-corrosive free-flowing materials up to 52 lbs/ft³ (833 kg/m³) average compacted bulk density.
- 2. Maximum horizontal wind pressure based on 94 mph (151 km/h) as per NBCC 2015 and 105 mph (169 km/h) as per ASCE 7-16.
- 3. Zero seismic activity.

Note

Seismic resistance in grain bins varies with height and diameter. Many standard designs have significant seismic capabilities. Designs can be reviewed and/or modified to reflect local seismic requirements.

- 4. Roof loading capabilities vary with diameter, peak load and snow load.
 - a. Peak Loads standard peak loads follow. Upgrades are available.

Table 1. Peak Loads for Various Roofs

Size	Type of Roof	Load (lbs)	Load (kg)
15' - 24'	- 24' non-structural 4000		1814
27'	non-structural	5000	2268

b. Roof Snow Loads (RSL) – at the above stated standard peak loads, standard RSLs vary with diameter and range from 22 psf (102.53 kg/m²) to 45 psf (219.7 kg/m²). *Upgrades are available*.

Note

The correlation between ground snow load (GSL) and roof snow load (RSL) for grain bin designs vary with jurisdictions. In the US GSL = $2 \times RSL$. In Europe GSL = $1.25 \times RSL$. In Canada the correlation between GSL and RSL varies and is site specific.

c. For maximum roof snow load capacities for various sizes and types of roofs, refer to the Roof Design Capacities sections that follow.

3.2. Guidelines for Supporting Catwalks and other External Loads on Twister

Frequently catwalk and related equipment loads are supported on grain bins. Such connections are commonly made into the grain bin stiffeners and across the peak. A grain bin is a thin shell structure primarily designed to withstand the internal uniformly distributed loads inherent with the stored bulk material inside of the bin. Special considerations must be given to the manner in which external loads are supported. Twister has developed products which are compatible with these requirements and considerations. If a third party solution is provided, the provider assumes full responsibility of the structure, its load distribution, and the manner in which it is connected to the grain bin. The following guidelines must form part of the third party design considerations.

Connection to Stiffeners

- 1. The available catwalk support stiffeners in Twister stiffened bins are for 10,000 lb incremental catwalk loads and 20,000 lb incremental catwalk loads per upgraded stiffener. The actual loads subjected to a single stiffener by the mating catwalk support shall not exceed these maximum capacities.
- 2. Twister recommends that the vertical load transfer between the catwalk supports and the stiffener occur over a minimum distance of 66" for 10,000 lb loads and 120" for 20,000 lb loads. Adequate connection strength must be provided.
- 3. The catwalk support stiffener in Twister bins are designed to provide vertical load support only. Any lateral loads subjected to the grain bin must be negligible.
- 4. There is a restriction of 2 upgraded catwalk support stiffeners per bin location. Therefore, the maximum supported load at the grain bin eave is 20,000 lbs (for two 10,000 lb upgrades) and 40,000 lbs (for two 20,000 lb upgrades). This can be repeated on the opposing side of the bin at a second location. Deviation from this must be approved by Twister Engineering.

Connection to Peak Rings

- 1. The allowable vertical peak load to any Twister bin roof is restricted to its published rated capacity. The load must be centered and evenly distributed into the peak ring. Any off-centre load and/or improper load distribution may cause roof failure.
- 2. A Twister structural roof requires the peak support loads to be transferred directly into the compression ring/roof rafter system. This is accomplished with peak load support brackets that are included with the structural roof. They must be installed as shown in the structural roof manual, connecting the peak support structure to the compression ring. They are required even if a non-Twister peak support structure is used. A non-Twister peak support structure needs to be designed to be able to connect with the brackets. The required bolt pattern is shown in the structured roof manual.
- 3. A Twister non-structural roof that is supporting a catwalk requires six clips to be installed in order to attach the flat cap to the peak ring. These clips are available from Twister.

3.3. Foundation Design and Loads

The foundations for the stiffened bin models are based on 3000 lbs. per sq. ft. (144 kPa) soil bearing capacity. All foundation designs use 3000 lbs. per sq. in. (21 MPa) ultimate compressive strength (after 28 days) for concrete and 43,500 lbs. per sq. in. (300 MPa) re-bar. The foundation designs included in this manual are suggestions only, and will vary according to local soil conditions. Twister will not assume any liability for results arising from their use.

Important

Foundation should be uniform and level. Level should not vary by more than $\frac{1}{2}$ " over a span of four feet under the bottom ring angle. Any variance from level must be shimmed under upright base assembly. If being utilized to support a full floor aeration system, this levelness requirement should extend across the complete floor area.

3.4. Lifting with Bin Jacks

Use bin jacks to lift the bin safely during assembly and help prevent strength and functionality problems later, including alignment, tolerance, bin roundness, distortion, and twisting issues.

⚠ WARNING

To prevent risk of serious injury or damage to the equipment:

- Prior experience is required. Do not use bin jacks if you are not properly trained or have never used them.
- Do not use bin jacks in windy conditions.
- · Do not exceed lifting capacity of a bin jack.
- Powered bin jacks are recommended. If using manually operated chain jacks, lift carefully and evenly to prevent damage.

For important additional information, refer to:

- Specifications section in your manual, the sales order, or approval drawing of the bin's radius and total
 weight of the grain bin (including roof, fasteners, stiffeners, and all accessories).
- Bin jack manufacturer's instructions and bin jack lifting capacity.

Tools and Equipment

Use the following to lift the bin:

- bin jacks (internal or external)
- scaffolding/ladders
- lifting lugs
- · drift pin
- socket/impact set
- wrench set

Additional tools and equipment may be required.

General Bin Jacking Instructions

Refer to the bin jack manufacturer's instructions in addition to the following to safely lift the bin during assembly:

- Use one bin jack per wall sheet.
- Confirm that the number of bin jacks can support at least 5X the weight of the bin.
- Fabricate lifting lugs to match the hole spacing on the bin.
- Assemble the top 1-2 wall sheet rings directly on the foundation.
- Layout and space the bin jacks evenly at each stiffener/seam according to the bin's radius.
- Anchor the bin jacks securely to the concrete.

- Connect the bin jacks securely to the stiffeners/seams.
- Lift using the bin jacks at an even and slow pace.
- Align the stiffener/seam holes with the wall sheet holes using a drift pin.
- When not actively assembling, lower the bin fully and secure it to the foundation to protect against wind gusts and other conditions.

3.5. Lifting Wide-Corr® Bins with Cranes

The table below lists the maximum height and weight limits for each diameter of bin which Twister approves for lifting by the roof using a crane. These limits assume that the total lifted load is evenly distributed around the peak ring, through the use of a lifting tripod or similar device of adequate strength. Any bin exceeding EITHER the height or weight limit MUST be lifted using jacks or similar method which supports the wall sheets directly.

These limits are critical. Failure during lifting carries the risk of serious injury or death.

Bin Diameter	Maximum Tier Height	Approximate Weight		
15'	7	5,200 lbs		
18'	1	5,200 lbs		
21'		9,000 lbs		
24'	8	3,000 105		
27'		11,000 lbs		

Table 2. Lifting Weights for Various Bin Sizes

Important Safety Notes

- <u>Limits above are based on safe lifting of the bin only. They are not based on design factors for lifting people or objects over people</u>. Adequate safety blocks or supports must be used when working under or near the bin wall.
- Extreme caution must be used when lifting bins more than a few inches, as occurs when mounting bins on hoppers. "Bouncing" of the load and/or wind gusts can add significantly to the loads on the roof and could cause overloading and/or failure.
- Please refer to any additional capacity information, lifting instructions, and safety information provided by the crane manufacturer.

3.6. Site and Assembly

Unless otherwise specifically provided in writing, Twister does not take responsibility for any defects or damages to any property, or injury to any persons, arising from or related to any site or assembly considerations, including but not limited to:

- Bin location and bin siting
- Soil conditions and corresponding foundation requirements (Note that the examples provided in manuals are for specifically stated soil conditions.)
- Bin assembly (Twister recommends the use of qualified bin installers. Contact Twister for information on installers in your area.)
- Field modifications or equipment additions that affect the bin structure
- Interconnections with neighboring structures

- Have the builder make all non-bin equipment in excess of Twister's recommendations. All such equipment
 including: LEGS, WALKWAYS, SPOUTING, and CONVEYORS must be self supporting.
- Compliance with all applicable safety standards, including but not limited to fall restraint systems (ladders or other systems). Contact local safety authorities as the standards vary between jurisdictions.

3.7. Methods of Installation

The recommendations for assembling and installing Twister grain bins must be closely followed to achieve the full strength of the bin and to achieve adequate weather sealing. The product warranty is void if:

- 1. Wall sheets and/or uprights not specified for a given tier are used.
- 2. Foundations are found to be inadequate or out-of-level.
- 3. Anchor bolts (cast-in-place, drill-in, chemical type or other) are found to be inadequate.
- 4. Off-center loading or unloading is used. (This does not apply to the use of approved side unloading systems).
- 5. Materials stored are not free-flowing or have a compacted bulk density greater than 52 lbs/ft³ (833 kg/m³).

If using bin jacks during assembly, always lift on an upright. Choose a hoist with an adequate capacity for the expected empty bin deadload. Make sure the rated capacity of the hoist is not exceeded.

3.8. Cutting Openings in Wide-Corr® Grain Bins

This section provides instructions for cutting openings to accommodate fan transitions, unloading augers and roof vents.

General Rules for Cutting openings

- 1. Never cut any uprights, roof ribs, or wall sheet bolted vertical seams to create an opening.
- 2. Openings shall be located so equipment being installed won't interfere with any bin components/ accessories.
- 3. Openings shall be minimized as much as possible for structural integrity of grain bins.
- 4. Corners in openings shall be cut with minimum radius of 1/8" to reduce stress concentration.
- 5. Openings shall be sealed all the way around for all weather conditions.
- 6. Instructions shall be followed closely to avoid damage to bin structure.
- 7. Except cutting openings described below, any other modification to Twister bins shall be approved by a professional engineer.

Openings for Fan Transitions of Aeration Floors

- 1. Consult aeration floor installation instructions for information on Planning floor layout.
- 2. Openings shall be centered to a wall sheet in horizontal direction.
- 3. Opening shall be cut as tight as it can be for the transition to go through and shall have no more than 1/4" gap on any side to the section of a fan transition going through a bin wall.
- 4. Opening height for fan transition shall be limited to 12.5" inches from bottom edge of a bottom wall sheet.

- 5. Opening width shall not exceed 46.5" for stiffened bins and 72.5" for unstiffened bins.
- 6. Vertical support shall be required to support load above opening.
- 7. Bottom angles may be cut flush to the sides of an opening to form part of opening.

Openings for Unloading Augers of Wide-Corr® Bins with Full Floor Aeration

- 1. Consult aeration floor installation instructions for information on Planning floor layout.
- 2. Openings shall be centered to a wall sheet in horizontal direction.
- 3. Openings shall be cut as tight as it can be for unloading auger to go through and shall have no more than 1/4" gap to auger flange section on any side.
- 4. Opening height for any auger shall be limited to 12.5" from the bottom edge of a bottom wall sheet.
- 5. Vertical flange of a bottom angle may be cut flush to sides of an opening to form part of opening.

Openings for Roof Vents in Roof Sheets

- 1. Openings shall be centered between roof ribs and have 2.5" minimum distance between edge of opening and base of a roof rib.
- 2. Openings can be square, rectangular, or round.
- 3. Openings shall be the same size as the inlet opening of a vent being installed.
- 4. Any side of a square/rectangular opening shall have a maximum length of 18" and a circular opening shall have a maximum diameter of 24".

3.9. Critical Assembly Requirements

To ensure a successful, safe and reliable outcome you must comply with the following assembly techniques and practices:

- 1. Comply with all local code and jurisdictional requirements applicable to your grain bin installation.
- 2. Design and build foundations with the necessary strength for the loads they must support, and for local soil conditions. Twister foundation guidelines are based on specific stated conditions and may not be applicable to local conditions.
- 3. Your foundation must provide uniform and level support to the structure being supported. Surface imperfections causing gapping must be remedied. This may involve, but not be limited to a) grouting under the bottom ring of a non-stiffened bin or tank, and b) shimming under the uprights of a stiffened bin or tank, or under the legs of a hopper.
- 4. Make sure that the proper hardware is utilized for all bolted connections. If a shortage occurs, do not substitute. Take the necessary steps to obtain the proper hardware. Make sure nuts are tightened to the required torque values as specified in the appropriate assembly manual.
- 5. Comply with all assembly instructions provided in the appropriate assembly manual to make sure your whole grain bin is constructed safely. Important: Do not deviate from the wall sheet and upright layouts provided.
- 6. Before anchoring your structure to its foundation, make sure the structure is round. The maximum variation from perfect roundness is 3/4" on the radius. Locate anchor bolts toward the outside of the anchor bolt holes (away from the circle) to permit the incremental expansion that can occur with the initial filling.
- 7. When installing roof stiffening rings, if it is necessary to shorten the stiffening ring tubes, shorten them as little as possible. Initially the nuts on the expanders should be centered and as close together as possible.

- When tightening, share the amount of take-up between expanders such that the nuts remain centered, and the amount of engagement between all expanders on the same ring is equalized.
- 8. If extending an existing bin or tank, ensure that the foundation is adequate for the increased loads it must support.
- 9. If installing an existing bin on a hopper, make sure the bin is designed for a hopper application, and that the foundation is capable of withstanding the substantial point loads that the hopper legs apply. If uprights are present, make sure that they are supported.
- 10. Make sure that an integral end-to-end connection exists between all mating uprights. Successive uprights must not overlap.
- 11. Vertical tolerances between uprights and wall sheets are tight. This can be affected by "jacking" techniques, which can allow the tolerance to grow or shrink depending on the technique used. The gapping between successive uprights must be monitored to ensure that upright holes align with wall sheet holes.
- 12. If catwalks are being installed on the structure, upright catwalk upgrades are likely required. The upgraded stiffeners must be installed in the correct locations to support the intended catwalk loads. Also, the structure must be properly oriented to ensure the eventual correct alignment between the catwalks and the supporting uprights. Finally, the connectors that tie into the uprights and support the catwalks are best installed during assembly of the structure. See the catwalk assembly manual for additional details.

3.10. Product Storage

If you won't be assembling the bin right away, store the bundles and boxes inside a building with good ventilation to prevent white or red rust from forming.

Note

White rust can be removed and does not cause permanent damage.



Red rust causes permanent structural damage.

Do not assemble any part containing red rust.

If you can't store the bundles and boxes inside, follow the instructions below for outdoor storage.

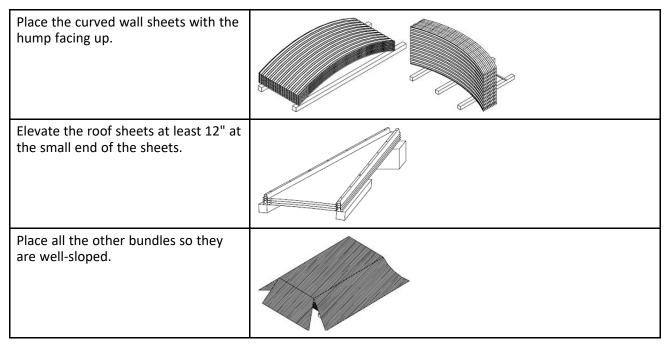
Storing Bin Bundles and Boxes Outdoors

Required Materials:

- Wood blocks
- Waterproof tarp

Storage Procedure:

1. First, place the bundles and boxes on wood blocks about 6"-8" off the ground.



2. For the bin boxes, ladder boxes, and hardware boxes: build a simple framework to support, cover with a waterproof tarp, and secure.

Note

The boxes are not waterproof and will deteriorate in normal weather conditions, allowing moisture to contact the parts inside.

If Parts Become Wet

- 1. Open the bundles as soon as possible.
- 2. Separate and dry the bin sheets or parts. Keep the parts separated until assembly.

A WARNING Risk of injury or damage.

Brace parts securely to avoid damage or injury from material falling when in storage.

- 3. Dry any boxed parts that are wet and store them in a new, dry box.
- 4. After drying the wall sheets, apply a food-grade oil with a clean, lint-free cloth.

Note

Applying oil will help prevent moisture to contact with the dried wall sheets.

WARNING Risk of slipping.

Do not use oil on roof sheets, ladders, or other parts where a person may walk or stand after the bin is assembled.

3.11. Grain Bin Use

- Fill the bin through the center roof opening only.
- Do not overfill the bin roof area! This may cause roof damage or failure.
- Do not off-center unload a grain bin. It is imperative to unload from the center of the bin first, until as much grain as possible has been removed, and only then proceed to unload from the next closest unload gate to

the center. Continue utilizing the unload gates in succession from the center towards the outside. Gate control mechanisms should be clearly marked and interconnected to prevent an external gate from being opened first.

- The only exception to center unloading is when a properly designed and installed side draw system is utilized. However, as bins tend to go out of round when employing side draws, the bin must be completely emptied before refilling.
- When unloading a bin with a mobile auger through a properly designed auger chute, the entry end of the auger should be pushed into the center of the bin before the auger is engaged. Slower rates of flow are preferable and should not exceed the capacity of an 8" auger.
- Ensure that the inner door panels of grain bin doors are completely closed and latched before filling the grain bin.
- Never enter a loaded grain bin for any reason. Grain can be a killer.

3.12. Important Notes

- Twister does not provide a foundation design for this product, and is not liable for any damages or injuries
 related to inadequately designed or constructed foundations. Customers must contract professional services
 for all foundation design and construction work.
- In order to maintain your wall sheets in good condition separate sheets and allow air circulation between them. Store sheets in a dry place. Do not store sheets with sheet ends pointing upwards.
- To keep an even pressure on walls, the bin must always be unloaded from the center.
- Contact local power officials for minimum power line clearance.
- See Section 3.9 Critical Assembly Requirements on page 18 for mandatory siting and assembly requirements.
- Store only non-corrosive, free-flowing materials up to 55 lbs/ft³ (880 kg/m³) average compacted density in Twister.
- Tighten all bolts to the recommended torque settings.
- Do not locate grain bins close to high buildings, which might cause snow to fall onto or build up on the roof
 of the grain bin. Consider future expansion and allow space for loading and unloading of the bin. Your dealer
 and local government agricultural consultants can help you plan your storage system for maximum
 efficiency.

4. Preparation

4.1. Check the Shipment

Unload the parts at the assembly site and compare the packing slip to the shipment. Ensure that all items have arrived and that none are damaged.

Report damaged parts or shortages immediately to your dealer. Your dealer will order replacement parts immediately to ensure that assembly will not be held up by missing parts. All parts will be charged for and credit will be issued by party at fault. No credit will be issued if freight bills are signed as received in good condition.

4.2. List of Tools and Equipment

Use quality tools and equipment. Use them safely, and correctly, for their intended use. Tools for this application should include:

Tools

- Electric or pneumatic (air) impact tools
- Power drill and drill bits
- Sockets (multiple 9/16" and 1/2" sockets recommended)
- Large-pocket carpenter pouch
- 8" (20 cm) metal punches (for aligning bolt holes)
- Step and extension ladders, construction grade
- 6-point wrenches (Imperial, box end)
- Metal-cutting saw suitable for cutting roof rings and wind rings
- Scaffolding
- Centre-post bin stand
- Crane and/or bin jacks

Minimum Recommended Safety Equipment

- · A properly-stocked first-aid kit
- Eye, foot, head, and hand protection (safety glasses, steel-toed boots, hard hat, work gloves)
- Cable, chain, or rope to tie-off bin or jacks in case of wind
- Body harness and lifeline (for use where falling hazard exists)
- Ground fault interrupt protected electrical hook-ups

4.3. Order Optional Equipment

Optional equipment such as unloading augers, aeration equipment, anchor bolts, foundation sealant, external ladders, safety cage and platforms, etc., should all be on site and checked before assembly starts. Plan your installation in advance. For details, see assembly instruction supplied with optional equipment.

4.4. Pre-Plan Assembly

Before assembling:

- 1. Read and understand this manual.
- 2. Develop an assembly plan, with consideration given to the layout of accessories and auxiliary equipment.
- 3. Predetermine the locations for access doors, anchor bolts, ladders, manways, side draws, roof steps, roof vents, fans, and other auxiliary equipment.
- 4. Plan your construction in accordance with your assembly and layout plan.

Important

Installation of accessories or equipment on grain systems equipment/structures that overstresses the bin in any manner will void the warranties.

In cases where additional loading is involved, if you do not already have specific recommendations from Twister, contact Twister engineering department in Grand Island, NE (USA) before installation begins.

Do not install Farm Series Bin on Hopper controls or the like near anything having a strong electromagnetic field such as large power transmission lines or transformers.

4.4.1 Pre-Planning: Side Draw Discharge, Aeration, and Unload Equipment

Side draw discharge pre-planning: Make certain side draw discharge does not fall on a vertical sidewall seam.

Figure 2. Never Position a Side Draw Opening at a Sidewall Seam

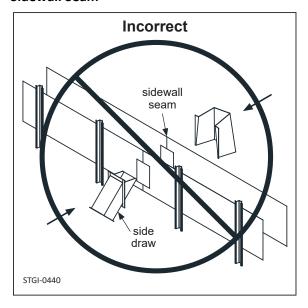
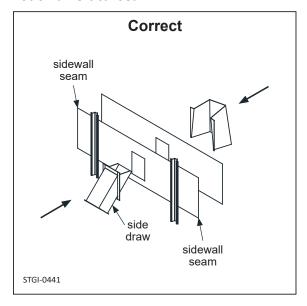
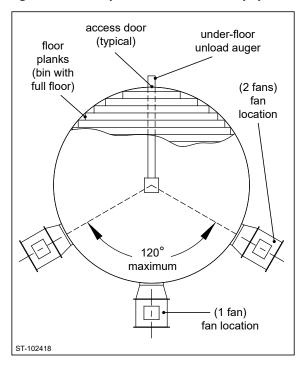


Figure 3. Position Midway Between Stiffeners and Not on a Vertical Seam



The following Figure 4 is one suggested guide for locating aeration fans and floor unload equipment.

Figure 4. Example Fan and Unload Equipment Layout



5. Assembly

5.1. Assembly Safety

- Always use the proper tools, rated lifting equipment, and lifting points for the job.
 - Do not stand on, under, or near any component that is not secured.
 - Carry out assembly in a large open area with a level surface.
 - Always have two or more people assembling the grain bin.
 - Make sure you have sufficient lighting for the work area.
 - Tighten all fasteners according to their specifications. Do not replace or substitute bolts, nuts, or other hardware that is of lesser quality than the hardware supplied by the
 - Stay away from overhead power lines and other obstructions during assembly. Contact with power lines can cause electrocution.
 - Do not work in high winds.
 - The equipment shall be installed in accordance with applicable local codes and regulations.

5.2. Bin Entry Anchor System: Non-Structured Roof

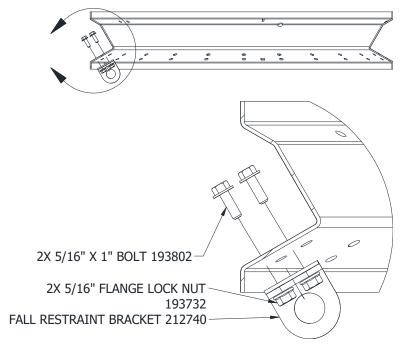
Important

The fall restraint bracket is rated for a maximum load of 2,000 lbs. The bin owner and user are responsible for correctly installing, using, and operating the Bin Entry Anchor System. The rope, pulley, and harness are not supplied by Twister.

MARNING Failure to install correctly as instructed below may result in serious injury or death.

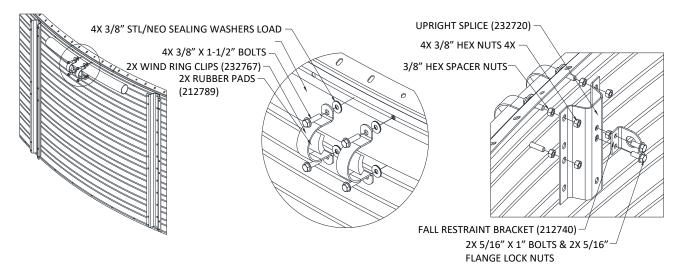
1. Install fall restraint bracket under peak ring as shown. Make sure to bolt the fall restraint bracket to the roof sheet with the inspection hatch cut out. (See Figure 5 on page 26.)

Figure 5. Installing the fall restraint bracket



- 2. Bolt the second fall restraint bracket to the upright splice. Then bolt the upright splice along the top wall sheet horizontal seam with the wind ring clips, sandwiching the load spreader tube and rubber pads as shown. (See Figure 6 on page 27.)
 - a. Field drill holes as needed on the wall sheet and top angle for the wind ring clip connections. Washers must be sandwiched between the wind ring clips and the wall sheet for sealing. (See Figure 6 on page 27.)
 - b. The load spreader tube and upright splice can be installed off center on the wallsheet (between the uprights on stiffened bins), for better reachability from the inspection hatch. Do not install the load spreader tube over a vertical wall sheet seam. (See Figure 6 on page 27.)

Figure 6. Installing the load spreader tube



3. Place the Fall Restraint Anchor Point Decals (PN 8110-01090) on the bin, see Section 2.9 – Decal Installation/Replacement on page 10 and Section 2.10 – Safety Decal Locations and Details on page 11 for installation instructions and placement.

5.3. Grain Gauge Installation and Operation (Optional)

The Grain Gauge™ is a clear polycarbonate unit that shows when the grain level reaches the top of the sidewall. The highly reflective tape is visible at night when a light is directed at it. When you can no longer see this reflective tape - the Grain Gauge™ is full and the grain auger should be shut off. The Grain Gauge™ and reflective strip comes packaged in the parts box.

Figure 7. Grain Gauge



If the Grain Gauge Cutout IS Present

The cut-out for the Grain Gauge is located in a separate top tier wall sheet.

- 1. Position the sheet with the cutout for maximum benefit, either;
 - facing the direction of the auger that will be loading the bin, or
 - directly under the inspection hatch for easy clean out.

The Grain Gage wall sheet can also be rotated to position the Grain Gauge at two possible positions:

- an upper position for smaller augers and/or larger bins
- a lower position for larger augers and/or smaller bins
- 2. Install the reflective strip on the center web of the cut-out as shown.
- 3. Caulk around the outside of the bolt holes on the Grain Gauge™ flange with the 1/16" x 3/8" tape caulking supplied.
- 4. Fasten the Grain Gauge™ to the decal sheet using grain bin bolts with the indented upside down "V" at the bottom.

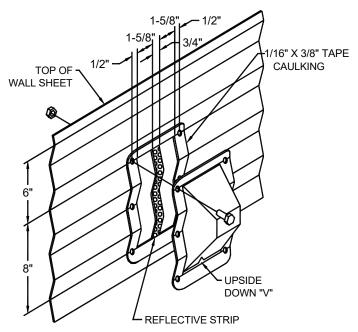
Note

Do not position the joint between two adjacent top ring angles directly over the Grain Gauge™ cutout. Insure that the top angle "bridges" the cutout and that the closest joint is at least 2 or 3 holes away.

If the Grain Gauge Cutout IS NOT Present

1. Using the grain gauge, position the grain gauge at a desirable location on the bin. The normal location is such that the top holes in the grain gauge are centered in the second corrugation valley below the top horizontal row of bin bolts at the eave (see Figure 8 on page 29).

Figure 8. Grain Gauge Detail



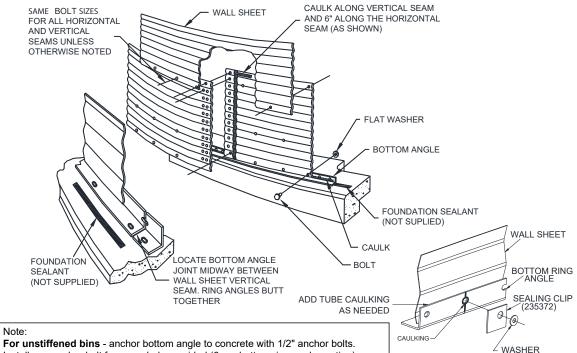
- 2. Mark and drill out holes using a 3/8" drill.
- 3. Mark and cut-out the two slots, using the holes as a reference, according to the diagram.
- 4. Install the reflective strip on the center web.
- 5. Install the grain gauge using bin bolts with the indented upside down "V" at the bottom.

5.4. Wall Sheet and Bottom Angle Assembly

Note

For bin hardware specification, refer to Section 7. – Appendix on page 46.

Figure 9. Wall Sheet and Bottom Angle Assembly Detail



Note:

Install one anchor bolt for every hole provided (6 per bottom ring angle section).

For stiffened bins - the bottom angle anchors are not required for stiffened bins as long as the stiffener base assembly anchors are making a good seal between the bottom angle and the foundation. If the seal is not good due to uneven concrete it is recommended to also anchor the bottom angle with as many 1/2" anchor bolts as are needed to achieve a good seal.

5.5. Farm Series Sheet Part Number Matrix

Table 3. Farm Series Sheet Part Number Matrix

CORRUGATED FLAT WALL SHEETS				PUNCHED WALL SHEETS 2005 AND LATER				
THICKNESS NOM (MIN)	GAUGE	LABEL COLOUR	WEIGHT Ibs	LENGTH Overall (hole-to-hole)	FLAT	REGULAR	воттом	
					194081	194092 Stencil		
.040 (.036)	20 Yellow 58	58.3	58.3	194698	194576 Grain- Gauge			
					194679	194550	194560	
					194085	194094 Stencil		
.050 (.045)	.050 (.045) 18 Orange	72.8	72.8	194699	194577 Grain- Gauge			
				194680	194551	194561		
.057 (.052)	17	Red	83.0	116.5"	194681	194552	194562	
.066 (.061)	15	Pink	97.7	(112.5")	194682	194553	194563	
					194683	194554	194564	
.076 (.070)	14	Lime	112.2	112.2		194718	194549 Grain- Gauge	
.096 (.088)	13	Green	141.1		194684	194555	194565	
.116 (.107)	12	Blue	171.4		194685	194556	194566	
.126 (.117)	11	Purple	188.2		194686	194557	194567	
.139 (.130)	10	Black	208.5		194687	194558	194568	
.168 (.159)	8	Tan	251.0		194688	194559	194569	
	SHORT SHEETS INSTALLED BESIDE WALK-IN DOOR							
.076 (.070)	14	Lime	67.1	69.6" (65.625")	194672	194570	194573	
.116 (.107)	12	Blue	102.4		194674	194571	194574	
.168 (.159)	8	Tan	150.0		194650	194572	194575	

Bottom wall sheets are punched for full floor aeration flashing. Use bin bolts provided to plug unused holes if a full floor aeration system is not being used.

5.6. Wall Sheet Caulking Detail

Figure 10. Wall Sheet Caulking Detail (inside view) — Imperial

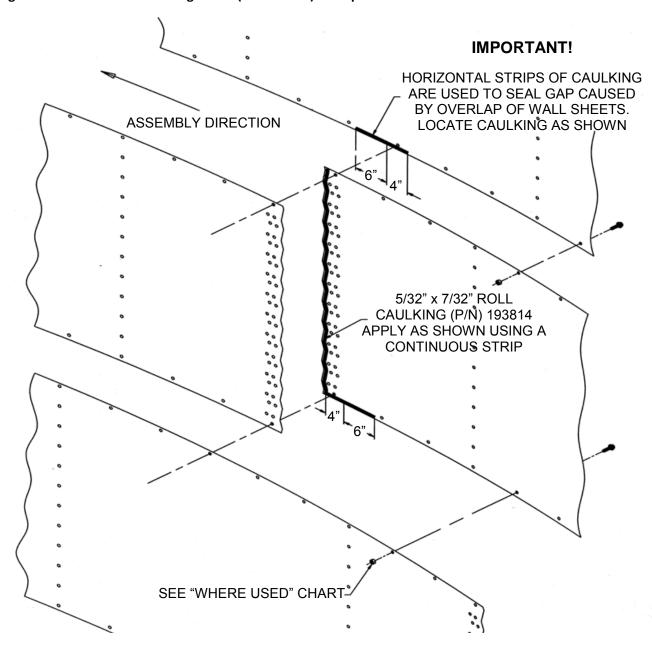
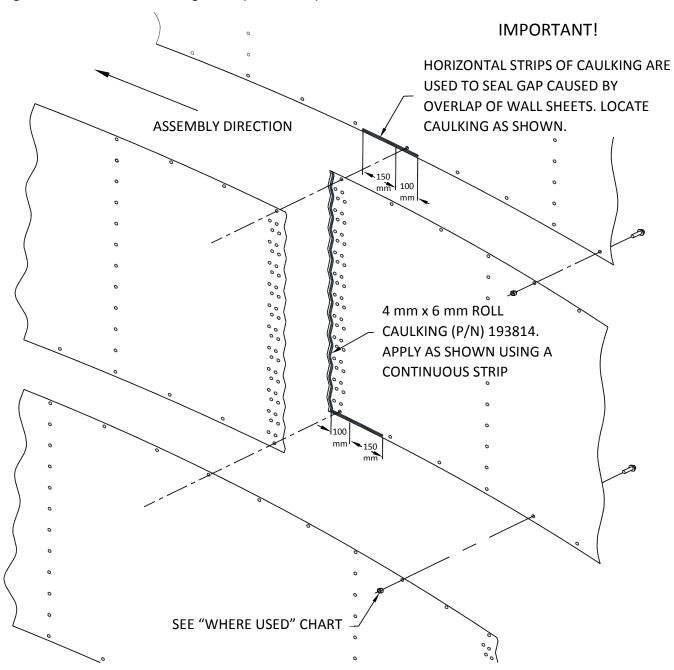


Figure 11. Wall Sheet Caulking Detail (inside view) — Metric



5.7. Hopper Cone to Bin Installation

New Bin Application

Use only Westeel Hopper Cones which are specifically designed to suit Westeel Wide-Corr Bins. When installing a hopper cone to a new bin installation refer to the following instructions:

- 1. Pour the foundation as per instructions provided with your hopper.
 - Ensure the foundation has fully cured before continuing the assembly of your bin.
 - If a Westeel skid base is used, a compacted gravel base can be used instead of a concrete foundation.
 - Follow the soil bearing information and site preparation instructions in Section 3. Before You Begin on page 13.
- 2. Assemble the bin as per the instructions in Section 5. Assembly on page 25.
 - For wall sheet layouts for the 15' 27' bin for hopper, refer to Section 5.8 Wall Sheet Layouts EFS
 Series on page 36.
 - The bottom ring angle and door installation instructions may be disregarded when your WC bin is installed on a hopper cone.
- 3. Position hopper cone on foundation and align hopper with bin as shown in Figure 12 on page 35.
 - Ensure all bottom holes on the bottom wall sheets are clear of bolts.
- 4. Use of a bin crane to lift your bin is recommended.
 - Ensure the crane and all other lifting devices have adequate capacity to handle the maximum bin weight safely.
 - · Lift the bin by placing a round support or 'tripod' inside the bin, directly under the vent collar.
- 5. Leave the vertical seam bolts loose on the bottom tier only for easy assembly.
- 6. Align the bin with the cone as shown in Figure 12 on page 35.
- 7. Fasten the bin to hopper cone with $3/8" \times 1-1/2"$ bolts, nuts and washers.
- 8. Insert one bolt on one side, the next bolt on the opposite side of bin, then the next two bolts at right angles to the first two.

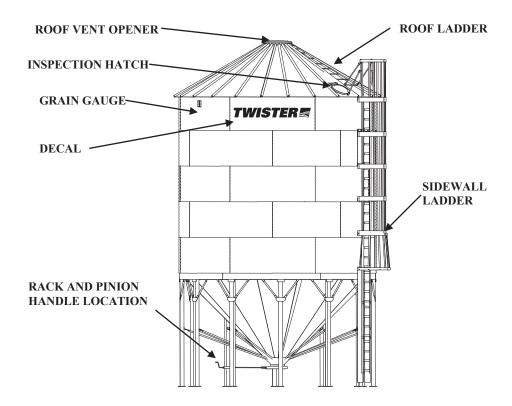
This will position the bin on the hopper properly.

9. Once the bin is in place, insert all other bolts and tighten the loose bolts.

Important

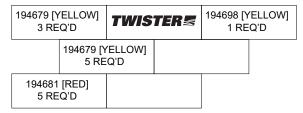
- Use only lifting devices of adequate rated capacity.
- Make sure the hopper cone is level and all load points contact the foundation.
- Make sure all fasteners are tightened as per torque instructions in Section 7.4 Recommended Bolt Assembly on page 50.

Figure 12. Hopper Cone to Bin Installation



5.8. Wall Sheet Layouts - EFS Series

Figure 13. Model 1503EFS



1503EFS

Notes:

- 1. Colors match part number label and indicate wall sheet thickness.
- 2. Stencil sheet is 194081 [YELLOW]

Figure 14. Model 1504EFS

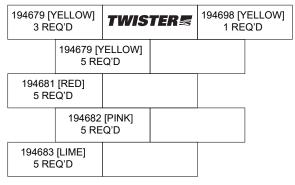


1504EFS

Notes:

- 1. Colors match part number label and indicate wall sheet thickness.
- 2. Stencil sheet is 194081 [YELLOW]

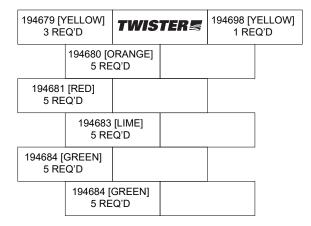
Figure 15. Model 1505EFS



Notes:

- 1. Colors match part number label and indicate wall sheet thickness.
- 2. Stencil sheet is 194081 [YELLOW]

Figure 16. Model 1506EFS



1506EFS

Notes:

- 1. Colors match part number label and indicate wall sheet thickness.
- 2. Stencil sheet is 194081 [YELLOW]

Figure 17. Model 1507EFS



1507EFS

- 1. Colors match part number label and indicate wall sheet thickness.
- 2. Stencil sheet is 194081 [YELLOW]

Figure 18. Model 1804EFS



Notes:

- 1. Colors match part number label and indicate wall sheet thickness.
- 2. Stencil sheet is 194081 [YELLOW]

Figure 19. Model 1805EFS



Notes:

- 1. Colors match part number label and indicate wall sheet thickness.
- 2. Stencil sheet is 194081 [YELLOW]

Figure 20. Model 1806EFS

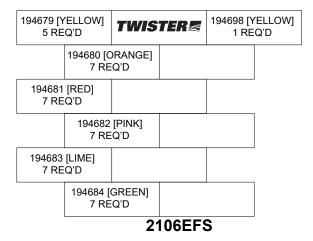


1806EFS

Notes:

- 1. Colors match part number label and indicate wall sheet thickness.
- 2. Stencil sheet is 194081 [YELLOW]

Figure 21. Models 2106EFS



- 1. Colors match part number label and indicate wall sheet thickness.
- 2. Stencil sheet is 194081 [YELLOW]

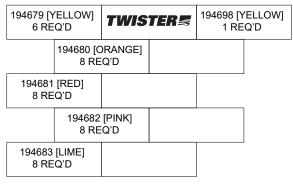
Figure 22. Models 2404EFS



Notes:

- 1. Colors match part number label and indicate wall sheet thickness.
- 2. Stencil sheet is 194081 [YELLOW]

Figure 23. Models 2405EFS



2405EFS

- 1. Colors match part number label and indicate wall sheet thickness.
- 2. Stencil sheet is 194081 [YELLOW]

Figure 24. Models 2406EFS

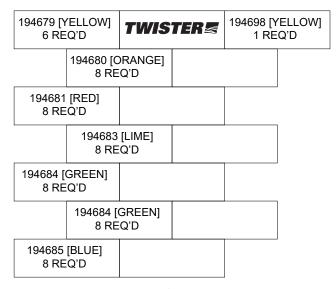


2406EFS

Notes:

- 1. Colors match part number label and indicate wall sheet thickness.
- 2. Stencil sheet is 194081 [YELLOW]

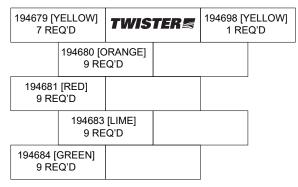
Figure 25. Models 2407EFS



Notes:

- 1. Colors match part number label and indicate wall sheet thickness.
- 2. Stencil sheet is 194081 [YELLOW]

Figure 26. Models 2705EFS

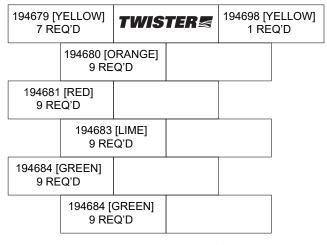


2705EFS

Notes:

- 1. Colors match part number label and indicate wall sheet thickness.
- 2. Stencil sheet is 194081 [YELLOW]

Figure 27. Models 2706EFS



Notes:

- 1. Colors match part number label and indicate wall sheet thickness.
- 2. Stencil sheet is 194081 [YELLOW]

Figure 28. Models 2707EFS

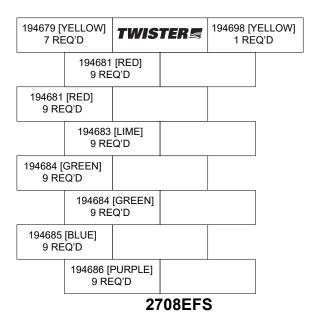


Notes:

- 1. Colors match part number label and indicate wall sheet thickness.
- 2. Stencil sheet is 194081 [YELLOW]

198863 R15 43

Figure 29. Models 2708EFS



- 1. Colors match part number label and indicate wall sheet thickness.
- 2. Stencil sheet is 194081 [YELLOW]

6. Specifications

6.1. Wide-Corr® Farm Series Grain Bin Specifications

Note

Farm series bins up to and including 10,000 bushels, can use the auger chute. All other bins require center unloading equipment.

Table 4. Wide-Corr® Farm Series Grain Bins "On Hoppers" Specifications

	NO 05	BIN DIAMETER	MAXIMUM CAPACITY			HEIGHT (does not include hopper)				
MODEL	NO OF TIERS					EAVES		OVERALL		
			bu ⁽¹⁾	m³	Tonnes (2)	ft	m	ft	m	
1504EFS	4		2400	80	65	14.8	4.52	19.0	5.78	
1505EFS	5	14'11"	2940	98	80	18.5	5.64	22.6	6.89	
1506EFS	6	4.55 m	3490	116	95	22.2	6.76	26.3	8.01	
1507EFS	7		4030	134	109	25.8	7.87	30.0	9.13	
1804EFS	4		3500	117	95	14.8	4.52	19.8	6.04	
1805EFS	5	17'11" 5.46 m	4290	143	116	18.5	5.64	23.5	7.16	
1806EFS	6		5080	169	138	22.2	6.76	27.1	8.27	
2106EFS	6	20'11" 6.37 m	6980	233	189	22.2	6.76	28.0	8.54	
2404EFS	4		6420	215	174	14.8	4.52	21.5	6.56	
2405EFS	5	23'10"	7820	261	212	18.5	5.64	25.2	7.68	
2406EFS	6	7.28 m	9220	308	250	22.2	6.76	28.9	8.80	
2407EFS	7		10620	354	288	25.8	7.87	32.5	9.92	
2705EFS	5		10010	335	272	18.5	5.64	26.1	7.94	
2706EFS	6	26'10"	11790	394	320	22.2	6.76	29.7	9.06	
2707EFS	7	8.19 m	13560	453	368	25.8	7.87	33.4	10.18	
2708EFS	8		15330	511	416	29.5	8.99	37.1	11.30	

CAPACITIES SHOWN INCLUDE 28° ROOF CONE.

- 1. BASED ON 1.244 CU. FT. PER BUSHEL AND 6% COMPACTION IN CYLINDER.
- 2. BASED ON 770 KG/M³AND 6% COMPACTION IN CYLINDER.

Note

EFS bins do not include hopper.

7. Appendix

7.1. EFS Parts Box Listing (Common Parts)

Table 5. EFS Parts Box Listing (Common Parts)

Part Number	Description	Unit weight (lbs)	15'	18'	21'	24'	27'
185010	CARTON 37x37x9 for BIN PARTS 15-27	9.40	1	1	1	1	1
234808	ROOF CAP 15-27	21.5	1	1	1	1	1
212201	PEAK RING 15	30.70	1	-	-	-	-
195149	PEAK RING BULB GASKET 105"	0.90	1	1	1	1	1
212228	PEAK RING FOAM for 15-27, 51-54	0.40	1	1	1	1	1
212740	FALL RESTRAINT BRACKET	0.30	2	2	2	2	2
234810	RCO PIVOT ARM 15-27	3.01	1	1	1	1	1
234814	RCO PIVOT ARM BRACKET 15-27	0.85	2	2	2	2	2
234812	RCO ROPE ARM 15-60	4.12	1	1	1	1	1
235219	RCO ROPE ARM SUPPORT 15-27	0.26	1	1	1	1	1
212404	RCO CABLE GUIDE	3.50	1	1	1	1	1
235798	RCO CABLE 9/32 x 45' GALV	0.75	1	-	-	-	-
212400	RCO SLIDE ROD 15-27	2.45	1	1	1	1	1
212402	RCO SLIDE ROD ANGLE	2.15	1	1	1	1	1
234804	RCO HARDWARE PACKAGE 15-27	4.70	1	1	1	1	1
193077	LADDER RUNG 38.5 (36.0 CTR)	4.60	1	1	1	1	1
193073	LADDER RUNG 30.5 (28.0 CTR)	3.60	1	-	-	1	1
193070	LADDER RUNG 24.5 (22.0 CTR)	1.70	1	-	-	1	-
193066	LADDER RUNG 16.5 (14.0 CTR)	1.10	1	-	-	1	-
235890	INSPECTION HATCH LID	7.48	1	1	1	1	1
235891	INSPECTION HATCH LATCH	0.81	1	1	1	1	1
235882	INSPECTION HATCH BULB GASKET 76"	0.50	1	1	1	1	1
212230	BIRD STOP	0.13	15	18	21	24	27
212231	FOAM ROOF RIB CLOSURE (12)	0.06	2	2	2	2	3
232767	WIND RING CLIP	0.44	2	2	2	2	2
212789	RUBBER PAD	0.06	2	2	2	2	2
232720	UPRIGHT SPLICE	2.14	1	1	1	1	1
212731	LOAD SPREADER TUBE 15	8.60	1	-	-	-	-
235914	BOLT HFS .313 x 1.00 GR8.2 - BAG 250	8.50	1	1	1	1	2
235916	BOLT HFS .313 x 1.25 GR8.2 - BAG 80	3.04	1	-	-	1	2

Table 5 EFS Parts Box Listing (Common Parts) (continued)

Part Number	Description	Unit weight	15'	18'	21'	24'	27'
	·	(lbs)					
235923	HEX FLANGE NUT .313 - BAG 250	3.50	1	1	2	2	3
235925	HEX FLANGE NUT .313 - BAG 50	0.70	2	3	-	2	-
235973	WSHR SEAL .313 STL/NEO - BAG 25	0.10	1	1	1	1	1
193071	LADDER RUNG 26.5 (24.0 CTR)	3.20	1	1	-	-	1
193068	LADDER RUNG 20.5 (18.0 CTR)	1.40	1	1	-	1	-
193064	LADDER RUNG 14.5 (10.0 CTR)	1.00	2	-	1	-	-
212732	LOAD SPREADER TUBE 18	8.60	-	1	-	-	-
235915	BOLT HFS .313 x 1.00 GR8.2 - BAG 50	1.70	-	1	2	4	-
212203	PEAK RING 18	30.70	-	1	-	-	-
235799	RCO CABLE 9/32 x 70' GALV	1.14	-	1	1	1	1
193074	LADDER RUNG 32.5 (30.0 CTR)	3.90	-	1	-	-	-
193065	LADDER RUNG 14.5 (12.0 CTR)	1.00	-	1	-	-	1
235917	BOLT HFS .313 x 1.25 GR8.2 - BAG 50	1.90	-	2	2	1	1
212204	PEAK RING 21	30.70	-	-	1	-	-
193075	LADDER RUNG 34.5 (32.0 CTR)	4.10	-	-	1	1	1
193072	LADDER RUNG 28.5 (26.0 CTR)	3.40	-	-	1	-	-
193069	LADDER RUNG 22.5 (20.0 CTR)	1.50	-	-	1	-	1
193067	LADDER RUNG 18.5 (16.0 CTR)	1.30	-	-	1	-	1
212733	LOAD SPREADER TUBE 21	8.60	-	-	1	-	-
212205	PEAK RING 24	30.70	-	-	-	1	-
193063	LADDER RUNG 14.5 (8.0 CTR)	1.00	-	-	-	1	1
212734	LOAD SPREADER TUBE 24	8.60	-	-	-	1	-
212206	PEAK RING 27	30.70	-	-	-	-	1
212735	LOAD SPREADER TUBE 27	8.60	-	-	-	-	1
194120	GRAIN GAUGE	0.30	-	1	1	1	1
194125	REFLECTIVE STRIP .75 x 8.2	0.00	-	1	1	1	1
235974	WSHR SEAL .375 STL/NEO - BAG 25	0.16	1	1	1	1	1
198863	MANUAL TWISTER - FARM	0.20	1	1	1	1	1

7.2. Farm Series and Hopper Bin Pail and Parts Box Listing (Non-Common Parts)

Table 6. 15' to 27' Farm Series Hopper Bins

	235941	235943	235946	235935	235950	235951	235956	235957	193814	170445
MODEL	BOLT HFS .375 x 1.0 GR8.2 - BAG 325	BOLT HFS .375 x 1.0 GR8.2 - BAG 50	BOLT HFS .375 x 1.5 GR8.2 - BAG 100	BOLT HFS .375 x 1.5 GR8.2 - BAG 55	HEX NUT .375 - BAG 300	HEX NUT .375 - BAG 100	FLAT WASHER .375 - BAG 200	FLAT WASHER .375 - BAG 75	CAULK- ING - 40' ROLL	CAULK- ING - 300 ml TUBE
1503EFS	1	5	1	1	2	1	ı	1	4	2
1504EFS	2	2	1	-	3	-	-	1	4	2
1505EFS	3	-	1	ı	3	2	ı	1	5	2
1506EFS	3	3	1	-	4	2	-	1	6	2
1507EFS	4	-	1	1	4	2	-	1	6	2
1804EFS	2	2	1	-	3	1	1	1	5	6
1805EFS	3	-	1	-	3	2	-	1	6	6
1806EFS	3	4	1	ı	4	1	ı	1	7	6
2106EFS	4	2	1	-	5	1	-	2	8	7
2404EFS	3	2	1	1	4	1	1	2	7	8
2405EFS	4	1	1	1	5	1	1	2	8	8
2406EFS	5	-	1	1	5	2	-	2	9	8
2407EFS	6	2	2	1	7	2	1	-	10	8
2705EFS	4	2	1	1	5	1	-	2	8	9
2706EFS	5	2	1	1	6	1	-	2	10	9
2707EFS	7	-	2	1	8	2	1	1	11	9
2708EFS	8	5	2	1	10	2	1	1	12	9

7.3. Bin Hardware

BOLT LENGTH	3/8" x 1" Flanged Hex Bolt (Washer)	3/8" x 1" Round Head Bolt	3/8" x 1-1/2" Flanged Hex Bolt (Washer)	3/8" Flanged Lock Nut	3/8" Hex Nut	3/8" Wingnut	3/8" Flat Washer
	232850 (700) 235941 (325) 235943 (50)	150594	235946 (100) 235935 (55) 193797	235954 (300) 235955 (50)	232850 (700) 235950 (300) 235951 (100) 193805	154208	235956 (200) 235957 (75)
WALL SHEET to WALL SHEET	•				•		
WALL SHEET to BOTTOM RING ANGLE	•			•			•
DRYING FLOOR FLASHING HOLES in BOTTOM WALL SHEET	•				•		
WALL SHEET to DOOR			•		•		
DOOR TIE-BACK to WALL SHEET	•				•		
AUGER CHUTE HOOD to AUGER DOOR BOARD		•			•		
AUGER CHUTE BLOCK-OFF PLATE to AUGER DOOR BOARD			•		•	•	
BIN WALL to HOPPER ASSEMBLY			•		•		•

7.4. Recommended Bolt Assembly

When tightening bolts, tighten the nut on the bolt until a "snug-tightened condition" has been achieved. A "snug-tightened condition" is defined in *Specification for Structural Joints Using ASTM A325 or A490 Bolts* (Research Council on Structural Connections: June 2004), which states:

"The snug-tightened condition is the tightness that is attained with a few impacts of an impact wrench or the full effort of an ironworker using an ordinary spud wrench to bring the connected plies into firm contact."

A properly tightened bolt will compress the sealing washer noticeably. All assembly crew members must be made aware of this requirement, and must know how to achieve a snug-tightened condition using common bin-building tools.

It is important that the bolts in the vertical wall sheet seams are tightened enough to squeeze the caulking and bring the wall sheet surfaces into firm contact with each other. This is especially important to monitor when installing bolts in temperatures approaching -10°C (14°F).

The following table shows the minimum impact gun torque capacity necessary to achieve a snug-tightened condition for bolts used in the assembly process.

Table 7. Recommended Impact Gun Torque Values Capacity to Achieve Snug-Tightened Bolts

Bolt Diameter	Bolt Grade	Grade Mark	Recommended Torque Capacity					
Boit Diameter	Boil Grade	Grade Mark	in-lb	ft-lb	N-m			
1/4"	Grade 8.2		75	6	8			
5/16"	Grade 8.2		215	18	24			
3/8"	Grade 8.2		370	31	42			
7/16"	Grade 8.2		600	50	68			
1/2"	Grade 8.2	P	960	80	108			
5/8"	Grade 8.2	~	1800	150	203			
3/4"	Grade 5	€\$	3230	269	365			

For proper sealing, do not overtighten the wall seam connections. Sealing is not critical on stiffener splice connections; these connections should be tightened securely to prevent loosening.

Hold the bolt head securely when tightening the nut to prevent damage to the sealing washer.

Important

Always tighten the nut, not the bolt.

Avoid bin assembly at temperatures below -10°C (14°F) if possible. Erection in low temperatures does not ensure strong, well sealed connections. Do not substitute bolts in place of those supplied by Twister.

Important

Do not substitute any other bolts/fasteners for those supplied by the **Twister** factory.

8. Limited Warranty: Twister Grain Bin Products

Westeel – Ag Growth International ("Westeel") warrants products that it has manufactured and/or that are branded with its name (the "goods") subject to the following terms and limitations, (the "warranty"):

Duration of Warranty

This warranty will run from the date of purchase from the dealer or distributor, authorized by Westeel. The duration of the warranty is limited as follows:

Twister Galvanized Bins	5 years					
EasyFlow2	24 months					
Westeel Fans	36 months					
Floors	12 months					
Catwalk	12 months					
Elite (Cones					
Paint	30 months					
Structural	10 years					
WESTEEL cones						
Paint	No Warranty					
Structural	12 months					
Smooth '	Wall Bins					
Paint	60 months					
Structural	10 years					
Commercial Smooth Wall Bins						
Paint	12 months					
Structural	10 years					

Limitation of Remedies Replacement

Within the warranty period, Westeel will replace the goods and/or original manufactured components thereof which are found, to Westeel's satisfaction, to be defective. Westeel is not responsible for direct, indirect, special, consequential, or any other damages of any kind, including personal injury to any individual, howsoever caused, including caused by transportation of the goods for repair or replacement.

Procedure for Obtaining Service

In the event of a warranty claim, the purchaser must complete any and all information required by Westeel in order to properly assess or investigate the claim. Westeel will not be responsible for the removal of any of the goods found to be defective, or transportation charges to and from Westeel's

authorized dealer or distributor, or for installation of any replacement goods and/or parts furnished under the warranty.

Limitations as to Scope of Warranty

The warranty does not extend to defects or damage caused, in whole or in part, by:

- 1. use of a kind and/or to a degree not reasonably expected to be made of the goods;
- 2. improper storage of the goods both prior to and after purchase;
- 3. damage caused by, or in the course of, installation or assembly;
- 4. any use of the goods which is not an intended use as specified in Westeel's published product literature, or otherwise specified by Westeel in writing;
- 5. any equipment attached to or used in conjunction with the goods;
- 6. any field modifications or substitutions to original bin components;
- 7. inadequate ventilation or any other circumstance not in keeping with proper maintenance and/or use of the goods;
- 8. Acts of God, accident, neglect or abuse of the goods by the purchaser and/or any other individual or entity; or
- 9. Any use or installation inconsistent with Westeel's Standard Disclaimers.

Limitations as to Manufacturer

The warranty does not cover products sold by Westeel that are not manufactured by Westeel. In those circumstances, the purchaser is referred to the manufacturer of those products.

Limitation of Implied Warranties and Other Remedies

To the extent allowed by law, neither Westeel nor its dealers, nor any company affiliated with Westeel makes any warranties, representations, or promises as to the quality, performance, or freedom from defect of any Product covered by this Warranty.

WESTEEL HEREBY DISCLAIMS, TO THE EXTENT APPLICABLE, ANY AND ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. A PURCHASER'S ONLY REMEDIES IN CONNECTION WITH THIS WARRANTY ARE THOSE SET FORTH IN THIS WARRANTY. IN NO EVENT WILL WESTEEL, ITS DEALERS, OR ANY COMPANY AFFILIATED WITH WESTEEL BE LIABLE FOR INCIDENTIAL, CONSEQUENTIAL OR PUNITIVE DAMAGES.

Some jurisdictions do not allow waivers of certain warranties, so the above waivers may not apply to you. In that event, any implied warranties are limited in duration to ninety (90) days from delivery of the products. You may also have other rights which vary from jurisdiction to jurisdiction.

Exclusive Warranty

This warranty is the only warranty provided by Westeel and all other warranties and/or commitments, whether express or implied and no matter by whom made, statutory or otherwise, are subsumed and replaced by it and are of no legal effect. If any provision of the warranty is held by a court of competent jurisdiction to be void or unenforceable, in whole or in part, such provision shall be deemed severable and will not affect or impair the legal validity of any other provision of the warranty.

8. LIMITED WARRANTY: TWISTER GRAIN BIN PRODUCTS

Westeel is an AGI Brand.

AGI is a leading provider of equipment solutions for agriculture bulk commodities including seed, fertilizer, grain, and feed systems with a growing platform in providing equipment and solutions for food processing facilities. AGI has manufacturing facilities in Canada, the United States, the United Kingdom, Brazil, South Africa, India and Italy and distributes its products globally.



Westeel Head Office Box 792, Winnipeg, Canada R3C 2N5

P 888.WESTEEL (937.8335) or 204.233.7133 | E customerservice.winnipeg@westeel.com | westeel.com

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