



X-Bracket Container Install Guide

Continuous Insulation ♦ Engineered Simplicity



Why Chose X-Bracket System?

The X-Bracket System by InSoFast® is the first of its kind and is compatible with both spray foam and a range of blown-in insulations. X-Brackets can be easily glued to shipping container walls, simplifying installation without puncturing the container. The X-Bracket system is low profile, with profiles as low as 2 3/8" from the surface of the container, maximizing both insulation and space inside the container.

Project Estimation

The quantity of X-Brackets is determined by the size of the container. The chart below shows the approximate quantity of brackets required for common shipping container sizes. If your build consists of multiple containers or if the container is not one of the sizes in the chart, please contact sales@insofast.com for a project estimate.

- For small openings, add three brackets to the estimated quantity.
- For large openings, do not add or subtract from the quantity of brackets in the chart below.

Size	# of Brackets	# of Boxes
20' STD	108	3
20' HC	108	3
40' STD	189	4
40' HC	189	4

Selecting Insulation Type

Condensation is the most important consideration when selecting the type of insulation you will install in your shipping container. Closed cell spray foam is an excellent option for use in shipping containers because it forms a vapor barrier to prevent air from reaching the condensation surface. Blown-in insulation is another option with the X-Bracket System for use on the exterior of the container in conjunction with a high PERM weather resistant barrier.

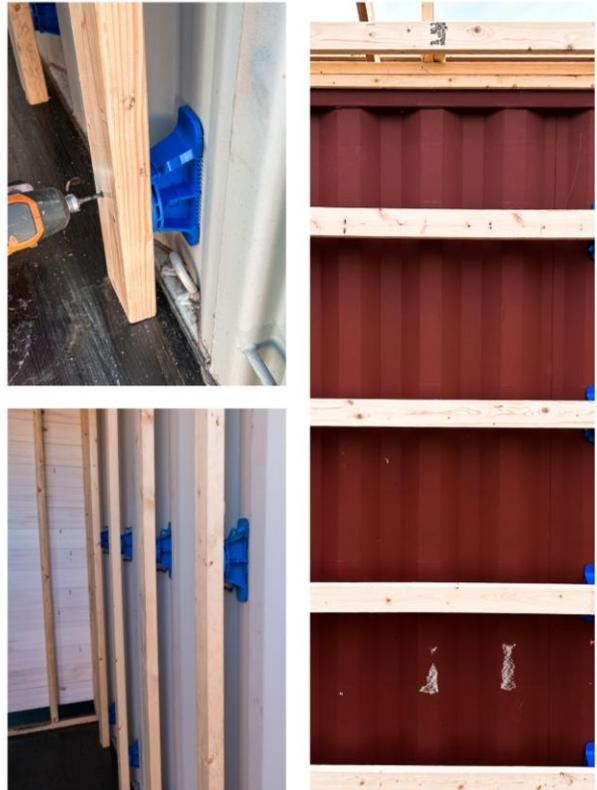


Furring Strip Selection

The X-Bracket System can be used with wood furring strips or with a metal hat channel. 2x4 furring strips are recommended for spans up to 48". When using metal hat channel, ensure the hat channel is sized appropriately for span distances.

Furring Strip Orientation

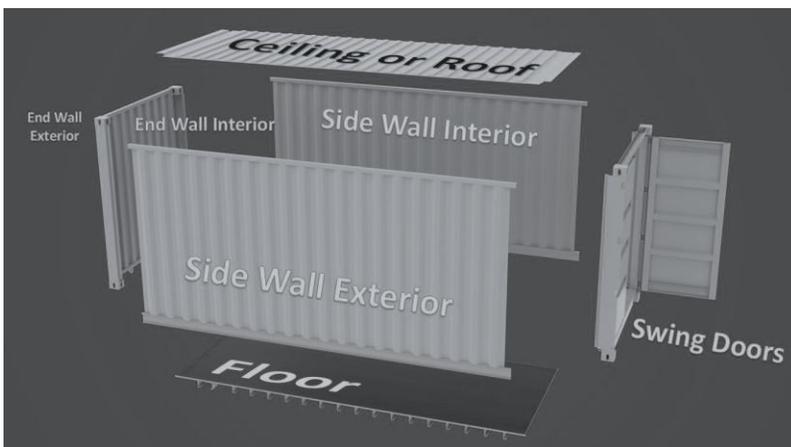
Furring strips can be oriented in either direction on the surfaces of the container. The orientation should be determined based on the finishes being installed in the container.



Vertical and Horizontal Furring Strips

X-Bracket and Furring Strip Spacing

The surfaces of the container are broken out into the surfaces as pictured below:





Side Walls

Horizontal Furring Strips: Furring strips are spaced at 24" O.C. and X-Brackets are spaced at 44" O.C., or every fourth corrugation, along the length of the container.

Vertical Furring Strips: Furring strips are spaced 22" O.C., or every second corrugation, along the length of the containers, and X-Brackets are spaced at 48" O.C. vertically. If installing in a high cube container, the top of the furring strips can cantilever up to 12", so only 3 rows of X-Brackets are required.



End Walls

Horizontal Furring Strips: Furring strips are spaced at 24" O.C. and X-Brackets are spaced at 40 1/2" O.C., or every fourth corrugation, along the width of the container.

Vertical Furring Strips: Furring strips are spaced 19. 1/2" O.C., or every second corrugation, along the width of the containers, and X-Brackets are spaced at 48" O.C. vertically. **If installing in a high cube container, the top of the furring strips can cantilever up to 12", so only 3 rows of X-Brackets are required.*



Ceilings

Lengthwise furring strips: Furring strips will be spaced at 24" O.C. across the width of the container and X-Brackets are spaced at 49.5" O.C., or every sixth corrugation, along the length of the container. A 2x2 cleat will be installed along each side of the container, attached to the wall furring strips, flush with the ceiling furring strips. The cleat will support the edges of the ceiling flush with the face of the furring strips, so there will only be three rows of X-Brackets down the length of the container.

Perpendicular Furring Strips: Furring strips will be spaced at 16 1/2" O.C, or every second corrugation. X-Brackets will be spaced 2' away from the side wall on each side of the container. A 2x2 cleat will be installed flush with the face of the X-Brackets on the ceiling to secure the ends of the furring strips. Please note, if there are horizontal furring strips on the side wall, the top furring strip must be a 2x6 to accommodate the cleat and still have room to secure finishes at the top of the wall.





Doors

Operable Doors: X-Brackets are not required on operable doors. Attach framing around the perimeter of each door using self-drilling screws. If additional framing is required, it can be attached to the framing around the perimeter of the door.

Inoperable Doors: Furring strips are spaced at 24" O.C. vertically and X-Brackets are installed on the main frame rail on each side of the door. X-Brackets are only required in the middle of the container on one side of the door.



Install X-Brackets

X-Brackets are installed with Bostick HDCA construction adhesive, provided by InSoFast, or with Loctite PL Premium 3X. Before applying adhesive to the X-Bracket, apply a tab of double back foam tape to the nailing flanges of the brackets. This will temporarily hold the brackets in place as the adhesive cures. Apply a 3/8" bead of adhesive in a circular pattern around the perimeter of the ribbed glue surface. Do not apply adhesive to the smooth nailing flanges. **Important: mist the adhesive lightly with water, decreasing cure time of the adhesive.** Press the X-Bracket to the surface of the container, ensuring the foam tape is bonding to the surface of the container. Allow adhesive to cure at least 48 hours prior to installing furring strips. Alternatively, X-Brackets can be installed with #8 or larger drill tipped screws, one in each nailing flange on the brackets.



Install Furring Strips

Install furring strips with one #8 or larger construction screw.



Electrical Rough In

If installing ROMEX or armored wire, electrical wires can be clipped into the wire clips located on the X-Brackets. Use electrical boxes with a front attachment flange or attach blocking behind the furring strips to use standard electrical boxes. If insulation is being installed on the outside of the container, cut-in boxes can be installed in the walls of the container. If installing conduit, secure conduit to the surface of the container.



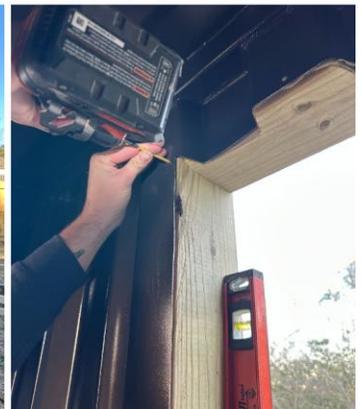
Plumbing Rough In

Flexible water lines that are ½" or smaller can be clipped into the electrical clips of the brackets. Other pipes or terminations should be secured to the surface of the container or to the furring strips.



Installing Windows or Doors

Cut the opening in the wall of the container, then install a buck around the opening. The buck can be made of wood (pressure treated or cedar), or with metal. Metal is not recommended for cold climates because it will cause condensation or frost to form on the inside of the container. Install windows per manufacturer's instructions, flashing the window to the surface of the container with flexible flashing tape or fluid applied flashing, or if using spray foam on the exterior of the container, the flashing only needs to be overlapped by the spray foam, not back to the container. Install doors in the rough opening per manufacturer's instructions.





Through-Wall Penetrations

Install penetrations prior to installing insulation. Seal penetrations to the shipping container surface. If installing blown in insulation, the penetration will also need to be sealed to the WRB.

Seal Vents

Seal the shipping container vents with flashing tape or sealant. This prevents spray foam from penetrating through the wall during installation and prevents air flow through the wall when using blown in insulation. Please note a ventilation system may be required to ensure safe air quality inside the container.

Installing Spray Foam Insulation

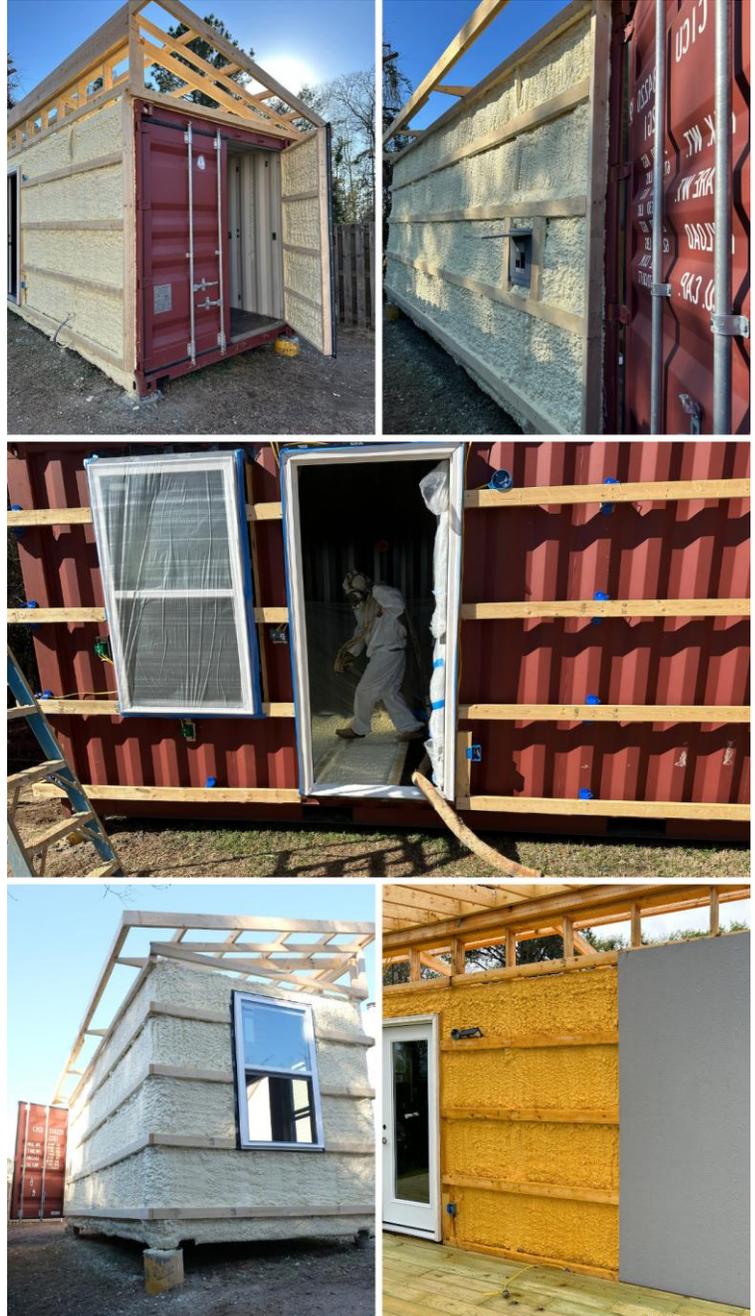
Mask off electrical boxes and plumbing terminations. Apply closed cell spray foam in the desired thickness, ensuring the spray foam coats the surface evenly and does not protrude past the face of the furring strips.

Installing Blown in Insulation

Blown in insulation is only recommended for exterior insulation. Install a WRB with a PERM rating over 20 over the X-Brackets before installing furring strips. Ensure the WRB is stretched tight. Install furring strips to the X-Brackets over the WRB. Blow in dense packed insulation either through the top of the wall or through slits in the WRB. Patch all slits with tape compatible with the WRB.

Installing finishes

Install finishes to the furring strips per manufacturer's instructions.





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