

SHIPPING CRATE CONSTRUCTION

CRATE CONSTRUCTION REQUIREMENTS

Build your crate so it is sturdy and falls within height and weight parameters when packed for shipment. If a crate exceeds size specifications or is poorly constructed, *FIRST* will not guarantee its security or its delivery to the site.

1. All Crates MUST

1. **Weigh less than 400 pounds when fully loaded.**
2. "Sit" on 2 pieces of 4" x 4" lumber, spaced at least 28" apart so it can be moved by a forklift.
3. Have a footprint no greater than 4' x 4' and be no taller than 5'10" (70") high. This maximum includes the 4" x 4" lumber mentioned above.
4. Be constructed so it can withstand stacking during transport and storage.
5. Have "**TEAM # XXXX**" (insert your team number) painted or stenciled in letters at least 6" high on at least one side of the crate. Shipping labels and paperwork often get lost in shipping. Painting your team number clearly on the crate will help to ensure that it arrives at your Pit Area on time.

2. All Crates Should

1. Be sturdily built to prevent damage to your equipment
2. Use 3/8" or 1/2" plywood or 3/8" or 1/2" Oriented Strand Board (OSB), a solid panel product of consistent quality with no laps, gaps, or voids.

Note: Medium density fiberboard (MDF) is not recommended for crate building because the material makes crate construction too heavy, and MDF can be dangerous to use if the correct safety precautions are not taken. MDF contains a substance called urea formaldehyde, which may be released from the material through cutting and sanding and cause irritation to the eyes and lungs.

Do not use particleboard because it collects moisture that adds weight and may cause the crate to fall apart. Remember, your crate may be exposed to the elements when loading and unloading trucks.

3. Crate Limit

FIRST asks that each team ship only one crate, but only allows a maximum of two (2) crates for any team at any competition site. This helps keep Pit entrances, aisles, and egresses clear, safe, and less crowded. This restriction also keeps team costs down.

If you ship a tool crate, it should also meet the above specifications. Teams pay all shipping and drayage costs for the additional crate.

4. Shipping Batteries

It is not mandatory that you ship your batteries with the robot, however, if you choose to ship the 12VDC batteries in the crate with the robot, federal regulations require teams to follow the instructions below.

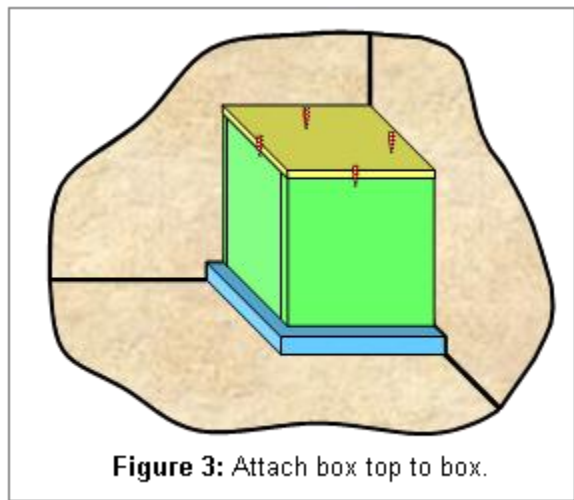
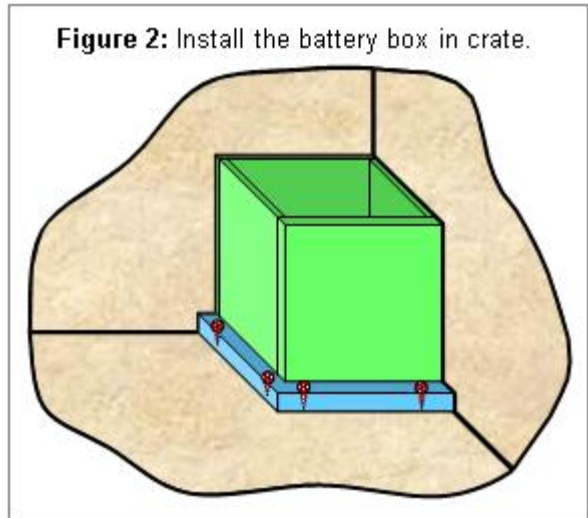
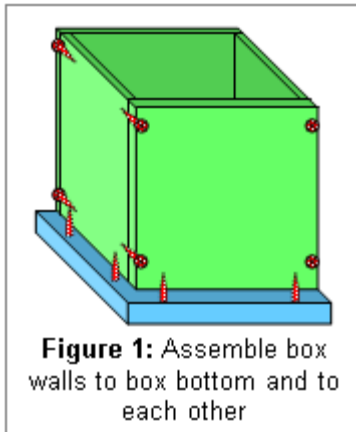
- NO batteries are to remain mounted on the robot (connected or not)!
- Ship them inside their original box or carton packaging.
- Use the Styrofoam covering with protective caps to cover the battery terminals.
- Secure the boxed batteries inside an “inner battery box.” See the Robot Shipping web page for further instructions on constructing an inner battery box.
- In the description section of your shipping paperwork, write “NON-SPILLABLE BATTERY INSIDE.”
- NOTE: International teams do not need to ship batteries with their robots to events in the US. Batteries will be provided for your use, via the spare parts table, at the regional events.

5. Instructions for Assembling an “Inner Battery Box”

Bill of Materials

Item #	Part Description	Material	Dimensions	Qty
1	Box walls	½” plywood	8” x 8½”	4
2	Box bottom	½” plywood	9” x 10”	1
3	Box top	½” plywood	8” x 9”	1
4	Fasteners	Staples <i>or</i> drywall screws	1¼”	16
5	Base fasteners	Staples <i>or</i> drywall screws	1¼”	4
6	Lid fasteners	Drywall screws	1¼”	4

1. Attach the box walls to the box bottom and to each other using the fasteners, spaced approximately as shown in Figure 1.
2. Install the box into your crate. Use the exposed 1” lip of the box bottom to secure the box to the crate using four more fasteners. Place fasteners approximately as shown in Figure 2.
3. Put your batteries in the box (Don’t forget to use the original packaging and styrofoam).
4. Secure the box top. Use 4 fasteners, positioned approximately as shown in Figure 3.



6. International Teams - Crates Crossing US Borders

The above sections apply to all crates. Crates crossing a US border have additional limits. Federal Rules apply to the crating and the pallets you will use to ship crates across US Borders to FRC events.

The US Dept. of Agriculture has adopted international guidelines to decrease the potential for the introduction of certain plant pests that may accompany wood materials arriving from other countries. The crate construction and pallet guidelines stipulate that wood packing materials be either heat treated or fumigated with methyl bromide in accordance with applicable rules. These wood materials must have the approved international mark certifying treatment.

ALL IMPORTS (with certain exceptions) WILL BE DENIED ENTRY IF THEIR WOOD PACKING MATERIAL DOES NOT CONFORM TO THESE GUIDELINES AND MARKING REQUIREMENTS.

All international teams, or US teams shipping into and out of the US, must do the following to comply:

- Use only plywood or other exempted wood materials when constructing their shipping crates and robots;
- If using raw wood materials such as 4" x 4", 2" x 4"s, 1" x boards, etc..., obtain the materials from a lumber dealer who sells compliant wood products;
- Be sure the wood is marked with the approved international mark;
- Make sure you use properly treated and labeled wood for the 4" x 4"s under your crate used for facilitating forklift use;
- If you must use a pallet to ship your crate, make sure it is either non-wood or a compliant wood pallet, available from commercial pallet distributors;
- Canadian teams should obtain an appropriate importer's statement as indicated; and contact your local FedEx office for additional information and assistance. You can also find information at: <http://fedex.com/us/promo/woodpackaging.html>