



## 2016 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 either its' security or 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.
  - a. All teams shipping robot crates to and from an international event – crates must be built of materials that are compliant with international shipping requirements, i.e., heat-treated and ISPM 15 compliant (resistant to fire, termites, insects, and any contaminants in general). For additional information, please visit:  
[http://internationalshippingusa.com/ispm\\_15\\_rules.aspx](http://internationalshippingusa.com/ispm_15_rules.aspx)
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.
  - a. **US and International Air Shipments** – for teams whose robot will ship by air, we strongly recommend robot crates have a footprint no greater than 4' x 4' and be no taller than 5' (60") high. This maximum includes the 4" x 4" lumber mentioned above. (Transportation carriers on some routes may lay a 70" high robot crate on its side.)
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 team's Pit Area on time.
6. Affix sheets of plexi-glass, plastic, or a sheet protector securely to the outside of your crate for a place to put the shipping documents before shipment. Failure to do this may result in lost or delayed robots, due to missing or ripped shipping documents.
  - a. We recommend purchasing a Job Ticket Holder, model number S-2761, from ULINE. You can see this product here:  
<http://www.uline.com/Product/ProductDetailRootItem.aspx?modelnumber=S-2761&root=y&keywords=s-2761>.

#### 2. All Crates **SHOULD**

1. Be sturdy once 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.
  - 1.2.1.1. **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.

- 1.2.1.2. **DO NOT** use particleboard because it collects moisture that adds weight and may cause the crate to fall apart. Remember that your crate may be exposed to the elements when loading and unloading trucks.

### 3. Crate Limit

FIRST asks that each team ship only one (1) crate but does allow for a maximum of two (2) crates for any team, granted an exemption, to ship to an FRC event **OR** for teams shipping to the Championship. This helps keep Pit entrances, aisles and egresses clear, safe and less crowded.

If you do ship a tool crate, it should also meet the above specifications. **NOTE:** Teams pay **ALL** shipping and drayage costs for the additional crate. The FedEx donation does **NOT** cover the cost of shipping a second 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:

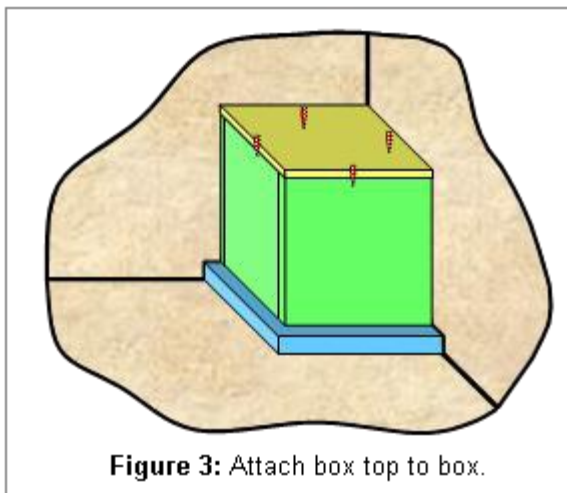
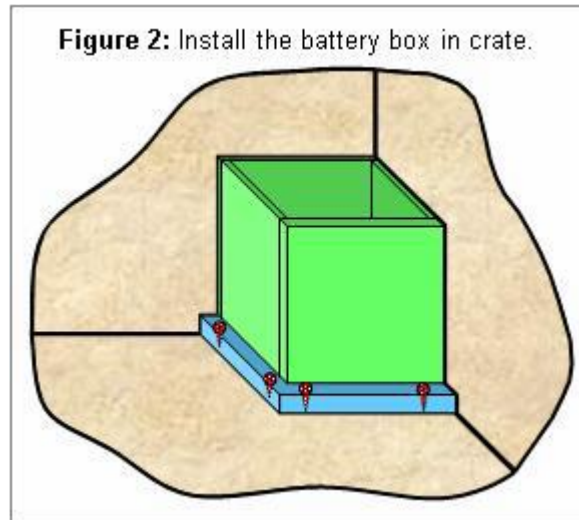
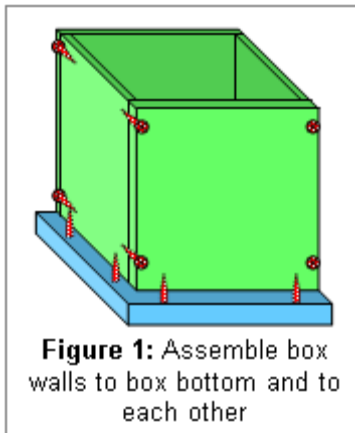
- **NO** batteries are to remain mounted on the robot (connected or not)!
- Ship them inside their original box or carton packaging.
- Use the Styrofoam covering with protective caps to cover the battery terminals.
- Secure the boxed batteries inside an “inner battery box.” See the instructions below on assembling an inner battery box.
- In the description section of your shipping paperwork, write “NON-SPILLABLE BATTERY INSIDE.”
- **NOTE: All International teams** (outside of USA and Canada) **DO NOT** ship batteries with their robots to events as it adds unnecessary weight. Batteries will be provided for your use and have been set aside for you, at the spare parts table, at the designated FRC event and/or the Championship.

### 5. Instructions for Assembling an “Inner Battery Box”

#### BILL OF MATERIALS

| <u>Item #</u> | <u>Part Description</u> | <u>Material</u>           | <u>Dimensions</u> | <u>Qty</u> |
|---------------|-------------------------|---------------------------|-------------------|------------|
| 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 or drywall screws | 1¼”               | 16         |
| 5             | Base fasteners          | Staples or drywall screws | 1¼”               | 4          |
| 6             | Lid fasteners           | Drywall screws            | 1¼”               | 4          |

- a) Attach the box walls to the box bottom and to each other using the fasteners, spaced approximately as shown in Figure 1.
- b) 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.
- c) Put your batteries in the box (Don't forget to use the original packaging and Styrofoam).
- d) Secure the box top. Use 4 fasteners, positioned approximately as shown in Figure 3.





## 6. International Teams - Crates Crossing U.S. Borders

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

The U.S. 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 U.S. teams shipping into and out of the U.S., **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; and
- 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; and
- 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://www.fedex.com/us/promo/woodpackaging.html>

## 7. **FIRST** Championship – Borrowing Crates

Teams are allowed to borrow a crate from other teams to ship their robot to the *FIRST* Championship, however the following items must be followed:

- Cover original team #
- Affix or apply your team #
- Cover or remove any other stickers, labeling, or documentation