

# Packaging and Securing Used Motive Batteries/Cells

THESE GUIDELINES ARE TO ASSIST IN COMPLIANCE WITH FEDERAL DEPARTMENT OF TRANSPORTATION (USDOT) REGULATIONS<sup>1</sup>. PLEASE ASSIST THE DRIVER IN COMPLYING WITH THE LAW. FAILURE TO COMPLY WITH THE GUIDELINES CAN RESULT IN REFUSAL BY THE CARRIER TO ACCEPT MATERIAL. IN ADDITION, FAILURE TO COMPLY CAN RESULT IN FINES AND PENALTIES FROM FEDERAL, STATE, AND LOCAL AUTHORITIES.

## INSTRUCTIONS FOR PREPARING USED MOTIVE BATTERIES FOR SHIPMENT

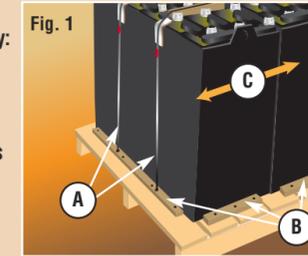
1. See "Important Skid/Pallet Specifications" Section.
2. Place all batteries upright and across the runners of the skid/pallet if possible.
3. Batteries must be free from leaks.
4. Multiple batteries can be banded together to consolidate a shipment to a standard skid/pallet size.
5. Adequate wooden cleats must be firmly nailed to the skid/pallet on all sides around the base of the battery(ies) perimeter, to prevent the battery from sliding off the skid/pallet during transport.



6. Batteries must be banded with steel or plastic banding<sup>2</sup> and adequate insulation. See "General Handling Requirements" for details.
7. Metal banding CANNOT come in contact with the posts or terminals of the battery.



8. Each battery should be secured to the skid/pallet by: Banding in one direction (See A in Fig. 1) and wooden cleats nailed to skid/pallet on all four sides of the battery (See B in Fig. 1). Banding should be placed in the same direction as the runners of the skid/pallet (See C in Fig. 1). The banding should pass through the skid/pallet as close as possible to the base of the battery to keep the load from moving during transport.



**NOTE:**  
Do not pass banding around the outside edge of skid/pallet to avoid skid/pallet failure during transport.

These Guidelines were developed by a committee of industry experts and are believed adequate to assure compliance with USDOT requirements effective as of December, 2010. However, especially if an incident occurs in transit, regulatory authorities may challenge the adequacy of your packaging and load securing notwithstanding your compliance with these Guidelines. Seek legal advice if you have any questions about these issues.



9. Skid/pallets must be properly blocked, braced, or otherwise secured in the trailer to prevent shifting of the load during transport.

<sup>1</sup> Title 49 C.F.R. 173.159 Batteries, Wet

<sup>2</sup> PLASTIC BANDING SPECIFICATIONS: PREFERRED: 3/4" polyester strapping, 2500 lb break strength – utilizing friction weld, NOT clips • LIGHT WEIGHT APPLICATIONS: 1/2" polyester strapping, 1400 lb break strength – utilizing friction weld, NOT clips • ALTERNATIVE MATERIAL (Manual Application): 3/4" polyester composite strapping, 2000 lb break strength – buckle joint

## IMPORTANT GENERAL HANDLING REQUIREMENTS

Before handling battery/cell(s), please read and adhere to all of the following requirements:

- Wear the appropriate personal protection equipment
- Handle all returned batteries with the same responsible care as new batteries
- Keep batteries upright at all times. Do not tip over on side or upside down
- Do not drop batteries. Put batteries carefully down on skid/pallet
- Only lead-acid batteries may be returned
- Do not double stack cells or batteries on skid/pallet
- Terminals must be protected with non-conductive caps, tape or other insulating material (i.e. waffleboard, cardboard) to prevent shorting
- Total height of package not to exceed 1 1/2 times the skid/pallet width
- Any damaged or cracked cell must be free of electrolyte and placed in a clear heavyweight polyethylene plastic bag (min. 6 mil) that is securely closed
- All vent caps must be in place

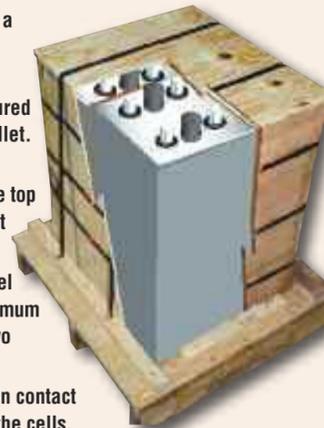
## IMPORTANT SKID/PALLET SPECIFICATIONS

- Use a skid/pallet provided with a new shipment to return used motive batteries if possible
- Maximum skid/pallet sizes: 48" x 44" or 48" x 40"
- Skid/pallet boards: 5/8" thick minimum preferred
- Skid/pallet must be constructed with a minimum of three bottom runners
- Skid/pallet sturdy and durable enough to handle the weight of battery load

## INSTRUCTIONS FOR PREPARING USED MOTIVE CELLS FOR SHIPMENT

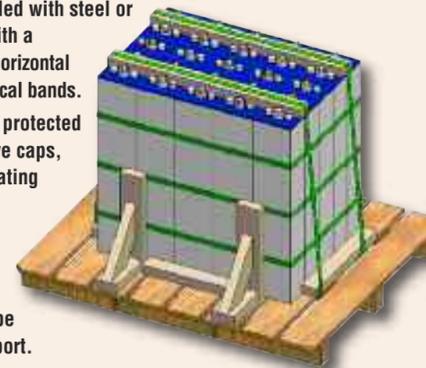
### SUPPORT BRACING METHOD: MULTIPLE CELL INSTRUCTION

- Cells must be palletized using a skid/pallet (See "Skid/Pallet Specifications" for details).
- Cells must be upright and secured with wooden cleats on skid/pallet.
- Adequate reinforcement (i.e. plywood) must be placed on the top and sides of the cells to prevent shorting, cutting or distortion.
- Cells must be banded with steel or plastic banding<sup>2</sup> with a minimum of three horizontal bands and two vertical bands.
- Metal banding CANNOT come in contact with the posts or terminals of the cells.



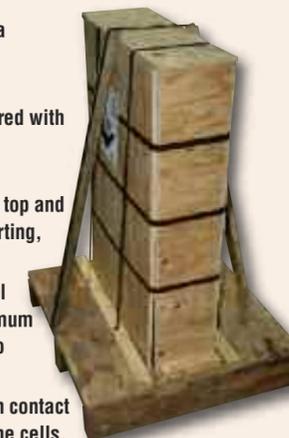
### ALTERNATIVE SUPPORT BRACING METHOD: MULTIPLE CELL INSTRUCTION

- Cells must be upright and secured with wooden cleats on skid/pallet.
- Cells must be banded with steel or plastic banding<sup>2</sup> with a minimum of three horizontal bands and two vertical bands.
- Terminals must be protected with non-conductive caps, tape or other insulating material (i.e. waffleboard, cardboard) to prevent shorting.
- Stretch wrap may be used for extra support.
- Metal banding CANNOT come in contact with the posts or terminals of the cells.



### SUPPORT BRACING METHOD: SINGLE CELL INSTRUCTION

- Cells must be palletized using a skid/pallet. (See "Skid/Pallet Specifications" for details).
- Cells must be upright and secured with wooden cleats on skid/pallet.
- Adequate reinforcement (i.e. plywood) must be placed on the top and sides of the cells to prevent shorting, cutting or distortion.
- Cells must be banded with steel or plastic banding<sup>2</sup> with a minimum of three horizontal bands and two vertical bands.
- Metal banding CANNOT come in contact with the posts or terminals of the cells.



### ALTERNATIVE SUPPORT BRACING METHOD: SINGLE CELL INSTRUCTION

- Cells must be palletized using a skid/pallet (See "Skid/Pallet Specifications" for details).
- Use gusset support bracing on all four sides.
- Terminals must be protected with non-conductive caps, tape or other insulating material (i.e. waffleboard, cardboard) to prevent shorting.
- Cells must be banded with steel or plastic banding<sup>2</sup> with two vertical bands across tops of cells.
- Cells must be palletized using a skid/pallet (See "Skid/Pallet Specifications" for details).
- Metal banding CANNOT come in contact with the posts or terminals of the cells.

