Federal Electronics Challenge
Electronics Stewardship One Byte @ A Time

PURPOSE

This document provides step-by-step guidance on packaging used electronics equipment for transportation. It includes instructions for large equipment (e.g., computers and monitors), small equipment (e.g., cell phones and external media) and peripherals, and lists specific packaging materials that can be used to prevent breakage.

PACKAGING USED ELECTRONICS FOR TRANSPORTATION

To avoid breakage and potential release of hazardous constituents, and to preserve equipment for reuse, it is important to package used electronic equipment properly prior to transportation. Proper packaging can also reduce the cost of transporting used electronics by making the transportation of bulky items more efficient, and consolidating large volumes of small products.

Properly packaging electronic equipment also:
- Reduces breakage of glass, cathode ray tubes (CRTs) and other components;
- Maximizes use of transport space;
- Simplifies handling and prevents injuries; and
- Makes it easier and faster to process material once it arrives at its destination.

IMPORTANT NOTE: If you are sending your equipment back to the manufacturer or to an electronics recycler for reuse, refurbishment, remanufacturing or recycling, they may have different packaging requirements. Check with the manufacturer or recycler prior to packaging your used electronics.

If equipment is being packaged for disposal rather than recycling please see "Additional Information for Electronics Disposal" at the end of this document.

Materials Descriptions

- *Pallets (also known as skids)*: Flat transport structures designed to be movable by a forklift. Typically 40″ x 48″.
- *Gaylord boxes*: Reusable triple wall corrugated cardboard boxes. Typically 48″ x 48″.
- *Shrink-wrap*: Polymer plastic film, generally available in rolls for packaging purposes.

Packaging Large Equipment on Pallets

The best method for transporting multiple pieces of large electronic equipment is to place them on pallets, bound by shrink-wrap. Large equipment may include computer desktop towers, laptops, monitors, televisions, printers, copiers, facsimile machines, and multi-function devices. When using pallets, make sure items are seated securely on the pallet and shrink-wrapped tightly from bottom up.

All external peripherals (keyboards, mice, etc.) should be packaged separately in boxes (see "Packaging Small Electronics or Electronics Peripherals in Gaylord Boxes" below).

Materials needed: Pallets, cardboard inserts, corner stiffeners, shrink-wrap, and labels.

- **DO** keep power cords with each piece of equipment.
- **DO** remove ink and toner cartridges, removable electronic media (e.g., disks, CDs, DVDs, USB drives) and paper.

- **DON'T** mix different types of electronics on one pallet. Pack all monitors together, all computers together, etc.
- **DON'T** mix different size electronics in the same layer. It is acceptable to have different size equipment in separate layers.
- **DON'T** include monitors or televisions with broken glass.

Loading a pallet:
1. Position a cardboard insert on a pallet.
2. Position each piece of electronics equipment flat on the cardboard insert. Position monitors and televisions face (glass) down. Depending on the equipment size, you should be able to get 12 to 18 computers per layer, or 9 to 12 monitors/televisions per layer. Do not mix different types of electronics on one pallet and do not mix different size equipment within the same layer.
3. Shrink-wrap each layer as it is completed. Position a cardboard insert on top of each completed layer, prior to starting a new layer.
4. Continue stacking equipment and cardboard inserts, up to a height of five feet.
5. To increase vertical stability, position cardboard or plastic corner stiffeners around each corner of the stacked equipment. These stiffeners should extend 8 to 10 inches above the top layer of equipment.
6. Shrink-wrap the combined layers tightly, starting at the bottom of the pallet.
7. To ensure the safe transport of the loaded pallet, the equipment must be secured tightly on the pallet. If the load appears to be unstable, remove layers until it is stable.

Labeling a pallet:
- Once the pallet is secured, label the pallet with the following information:
  - Organization name;
  - Date packaged;
  - Exact item count and weight (if known); and
  - Whether the pallet includes CRTs.

Packaging Large Equipment in Gaylord Boxes

If you don't have enough equipment to fill a pallet, you can pack electronics equipment in Gaylord boxes. Make sure that the boxes you are using are sturdy enough to carry and protect the equipment.

Materials needed: Pallets, Gaylord boxes, packaging materials, cardboard inserts, packing tape, and labels.

Loading a Gaylord box:
1. Secure a Gaylord box on a pallet.
2. Position each piece of electronics equipment neatly within the box.
3. Surround the equipment with packaging materials like bubble wrap, foam peanuts, etc., to cushion them.
4. If you are packing more than one layer of equipment in a box, place cardboard inserts between layers.
5. Do not overfill the box (leave 4 to 6 inches airspace on top).
6. Tape the box securely shut.
7. Mark which side is up clearly on the outside of the box.

Labeling a Gaylord box:
1. Once the box is secured, label the box with the following information:
   - Organization name;
   - Date packaged;
   - Exact item count and weight (if known); and
   - Whether the box includes CRTs.
2. After the box is packed and labeled, tape all seams with packing tape.

Packaging Small Electronics or Electronics Peripherals in Gaylord Boxes

Small electronics and electronic peripherals are best packaged by placing them in Gaylord boxes. Some manufacturers or recyclers may require that this equipment be segregated when packaged. The following is a general segregation practice for boxing small electronics and peripherals; please check with the recipient for their specific requirements:

- Combine keyboards, mice, speakers, and other low-end peripherals.
- Combine cellular phones, personal digital assistants (PDAs), external media drives and other high-end peripherals.
- Combine all cables, cords and loose wiring.

Materials needed: Pallets, Gaylord boxes, packaging materials, cardboard inserts, packing tape, and labels.

Loading a Gaylord box:
1. Secure a Gaylord box on a pallet.
2. Place groups of small electronics or peripherals in the box.
3. Surround the equipment with packaging materials like bubble wrap, foam peanuts, etc., to cushion them.
4. If a box is not full, it is acceptable to combine small electronics and peripherals. Check with your recipient, which may require that cardboard inserts be used to separate groups of small electronics or peripherals within the box.
5. Do not overfill the box (leave 4 to 6 inches airspace on top).
6. Tape the box securely shut.
7. Mark which side is up clearly on the outside of the box.

Labeling a Gaylord box:
1. Once the box is secured, label the box with the following information:
   - Organization name;
   - Date packaged; and
   - Exact item count and weight (if known).
2. After the box is packed and labeled, tape all seams with packing tape.

Additional Information for Electronics Disposal

For electronic equipment being sent for disposal rather than reuse or recycling, there are certain requirements under the Resource Conservation and Recovery Act (RCRA). RCRA requires any business disposing of materials to ascertain the following with respect to each material:
- Are the materials being disposed of solid wastes?
- If classified as solid wastes, do the materials also designate as hazardous wastes?
- If designated as hazardous waste, what is the business' generator status based on the quantity of materials being generated per month?
- If designated as hazardous waste, are the materials being managed and disposed of in accordance with the business' generator status?
- If designated as hazardous waste, has the business complied with the RCRA record-keeping requirements in accordance with its generator status?

If you are disposing of electronic equipment and need more information on hazardous waste designation please see Title 40 of the Code of Federal Regulations:
- Part 260 Hazardous waste management system: general
- Part 261 Identification and listing of hazardous waste
- Part 262 Standards applicable to generators of hazardous waste
- Part 263 Standards applicable to transporters of hazardous waste

REFERENCES

Information for this resource was taken in part from UNICOR's packaging instructions, available at: http://www.unicor.gov/recycling/packageinfo.cfm.

Title 40 of the Code of Federal Regulations is available at: http://ecfr.gpoaccess.gov/.

CONTACT INFORMATION

If you have questions related to this resource or need other assistance with the Federal Electronics Challenge, please contact your Regional Champion: http://www2.epa.gov/fec/technical-assistance.

Visit the FEC online: http://www2.epa.gov/fec/

E-mail the FEC: fec@epa.gov