



Supplier Delivery/Packaging Requirements

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Rev D

Change Summary

Significant changes to the document, including adding a section for electrical components, revising the acceptable chemicals for preservation, adding splines to the gear section, revising methods for preservation on several items, and changing the format.

IMPORTANT SAFETY INFORMATION

Personnel working in or on a Clipper turbine, project or facility shall follow all applicable Clipper and Project Owner Environmental Health and Safety policies. In addition, all personnel shall have received documented training from a competent person pertaining to their planned activities prior to beginning any work or accessing any equipment on a Clipper site or at a Clipper facility.

	CAUTION
	Adhere to all Clipper Environmental Health and Safety policies, including the use of personal protective equipment during the performance of procedures outlined in this document and whenever applicable.

RECOGNIZE SAFETY SYMBOLS, WORDS AND LABELS

DANGER

DANGER—Immediate hazards which **WILL** result in severe personal injury or death if policies and procedures are not strictly adhered to.

WARNING

WARNING—Hazards or unsafe practices which **COULD** result in severe personal injury or death.

CAUTION

CAUTION—Hazards or unsafe practices which **COULD** result in minor personal injury or product or property damage.

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General Requirements

Overview

This document applies to all suppliers in receipt of a purchase order from Clipper Windpower Inc. and is also intended to serve as a tool during the bidding/quoting process.

This document is applicable to all suppliers who provide products to Clipper unless otherwise stated upon technical specifications, component drawings or Clipper purchase orders.

In the event of conflict between this process and other Clipper documentation the following order of precedence should be applied:

- Purchase Order
- Component Drawing
- Technical Specification/component specific packaging instructions
- This Supplier Delivery Specification

General Information

Vendors shall package products in a way that provides protection from damage, corrosion, and deterioration so that the product arrives at Clipper and/or predestination prior to final arrival to Clipper in the same condition as when it was packaged.

The product must be removable from the packaging using standard warehouse tooling without causing damage to the product.

See Labeling, Invoicing, and Documentation Requirements for additional configuration information.





Approximate weight in US pounds must be included on the exterior of all packaging.

Vendors must have a packaging quality system in place. Upon request by Clipper, vendors must produce a packaging, shipping, or loading plan for all Clipper-purchased components. This document may be informal but must cover handling/packaging of Clipper components for shipping.

If vendor's existing packaging and preservation plan is approved in writing by Clipper, vendor may package and preserve according to their plan in lieu of the requirements set forth by this document.

Standard Symbols

Clipper requires ISO R/780 symbols to be used on packaging. The most common include:

			
Fragile	Fragile / Handle With Care	Keep upright / This end up	Keep Dry



Hazardous Materials

Follow all applicable state and federal mandates for shipping hazardous cargo. Packages must be labeled according to regulations.

MSDS information must accompany shipments of chemicals and other products that have HMIS ratings as dictated by United States law.

Health, Safety and Environment

The materials used in the packaging shall not be harmful to personnel and shall not require any special health precautions when parts are removed from packaging and processed in assembly.

Wooden boxes shall be as free from splintered edges, exposed nails and screws as possible.

All packaging shall provide a safe means of storage - clearly identify any stacking or special storage requirements or limitations.

All materials shall have a low adverse impact on the environment - materials which present recycling or landfill disposal problems shall not be used. Questions about materials may be directed to Clipper Supply Chain.

All wood packing material used to ship products shall meet plant health requirements of the international standard for Solid Wood Packing Material (*SWPM*) and be in compliance with the International Standard for Phytosanitary Measures (*ISPM*) - No. 15. This typically would include wood used for packing cases, boxes, crates, dunnage, pallets, and box pallets.

All products / packages delivered shall be safely loaded onto delivery vehicles to enable direct fork truck access; heavy containers / parts shall not be stacked on top of lightweight containers / parts.

The method of packaging shall enable removal of parts without risk with particular attention being paid to the protection of sharp edges and machined surfaces which present particular problems during unpacking.

Documentation Requirements

Vendor Serial Numbers

To comply with Clipper's MRP system requirements, vendor serial numbers on Clipper specific parts and assemblies must contain no more than 18 alphanumeric characters (A-Z, 0-9 only). No special characters (/ , \ , - , * , etc.) are permitted.

Labeling

All containers shipped to Clipper Windpower facilities must have a label on the outside of the parcel containing the following information:

Clipper division and/or employee the parcel is directed to (if known)

Lot number (if applicable)

Serial number (if applicable)

Clipper part number and revision information (revision only required if applicable)

Clipper purchase order number (if applicable; or no purchase order part)

Quantity

Vendor name



Ship date

Non-conforming material number

Number parcel out of a multiple-parcel shipment (i.e. 4 of 8)

QIR(s) (Quality Inspection Reports) number (if applicable)

Packing lists must be included on the EXTERIOR of the parcels

If multiple pallets are used, packing slip/paperwork shall be affixed to “pallet 1” or the “lead pallet”

MSDS information must be included on the exterior of the packaging

Packing Slips/Bills of Lading

Packing slips/lists and bills of lading must include the following information:

Clipper purchase order (PO) or non-conforming material (NCM) number

Quantity and unit of measure – UOM must match print or design specs (if applicable)

Clipper part number and revision

Lot/serial number

Description of part/parts

Ship date

Name of the person to whom the shipment is destined (required for non-inventory parts only)

Vendor name

Packing slips for kits shall include all information listed above.

A master packing slip must be included that denotes cumulative quantities of each component in the entire shipment.

Vendors with Clipper Owned Material

Vendors with Clipper-owned material must send a quarterly listing of inventory including serial numbers, lot numbers, and descriptions – if applicable to the Consigned Inventory Analyst at Clipper Windpower. Contact Clipper Supply Chain for more information.

Inspection Compliance

Certificate of Compliance must be included with the product shipment as required by the purchase order.

Inspection reports must be included with the product shipment as required by the purchase order.

Shipping Multiple Part Numbers

Should a PO provide for multiple part numbers, each part number should be shipped in a separate container AND IDENTIFIED on the container, bag, box, pallet, etc.

Each purchase order product and quantity must be shipped in a separate box or container with its own paperwork. **DO NOT MIX MULTIPLE PURCHASE ORDERS IN THE SAME BOX.**

Multiple part numbers may be shipped on / in the same pallet or crate as long as each part number is in a separate container within the crate or on the pallet.



Invoices

All invoices must be addressed to:

Clipper Windpower, Inc.

Attention: Accounts Payable

6305 Carpinteria Avenue, Suite 300

Carpinteria, CA 93013

Or electronically to: AccountsPayable@Clipperwind.com

(PREFERRED METHOD)

All invoices must contain the following information:

Clipper purchase order number

Reference to the corresponding packing slip (must include packing slip number)

Address where shipped

Clipper part number, quantity, and unit of measure

Lot and/or serial numbers

General Container Information

Pallets

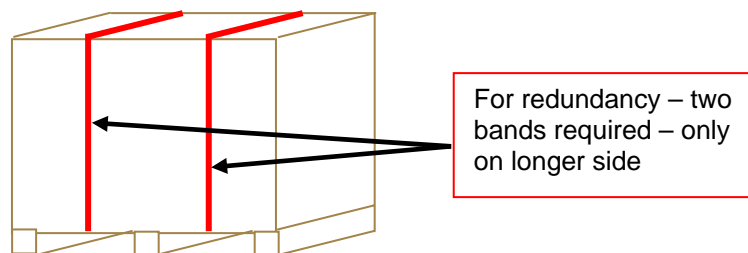
1. All loads shipped on pallets must be secured to the pallet using one of the methods listed below. The means selected must be sufficient enough to support the load contained on the pallet during normal shipping and handling maneuvers. No unsecured loads are permitted.
 - a. Shrink wrap or plastic stretch wrap
 - b. Hardware - Must not interfere with lifting/loading pallet and shall not protrude beyond outside pallet dimensions
 - c. Metal or plastic banding - Cardboard or other suitable dunnage must be placed between the banding and the product
 - d. Nylon ratchet straps - Cardboard or other suitable dunnage must be placed between the banding and the product
2. The vendor shall ensure that pallets are in good condition when they depart for Clipper with no overtly loose or broken boards, protruding nails, etc.
3. Oversize loads
 - a. Wherever possible, the contents shall not project beyond the outside dimensions of the pallet
 - b. All parts with exposed machine surfaces must be on a pallet of adequate dimensions to provide protection to all machined surfaces
 - c. When it is necessary for an oversize load to be secured to a pallet, any material exceeding the length or width of the pallet shall be strapped together and protected as effectively as

possible against mechanical damage; Clipper strong preference is that loads be fully contained within the dimensions of a pallet

- d. Oversize loads must be positioned on the pallets so that the load does not interfere with lifting using a forklift
4. Pallets must be of sufficient structural integrity to support its load
5. Machined surfaces must not come in direct contact with a pallet; VCI paper appropriate for the metal type such as Daubert Cromwell UniWrap®, Cortec® VpCI-144, or Armor Wrap® shall be used as a barrier between the pallet and the machined surface
6. All pallets and other wood products shipped internationally must conform to 7 CFR 319.40-3 and ISPM 15 treatment and marking standard and bear the acceptable international seal

Crates

1. All crates and other wood products shipped internationally must conform to 7 CFR 319.40-3 and ISPM 15 treatment and marking standard and bear the acceptable international seal.
2. Unless prior written authorization from Clipper is received, all crates must contain four walls, a base, a top, and skids on the bottom so that a forklift may be used. LIDS ARE REQUIRED.
3. When constructing crates, no smooth nails may be used. Only wood screws or ring shank nails suitable for structural framing may be used to construct crates. Any portion of the shipping container, skid, or crate that is designed to be removed in order to unpackage the component must be secured with wood screws only – NO NAILS. Nails are acceptable on the remainder of the element.
4. OSB and other wood laminates are permissible as long as they are structurally capable of supporting the load.
5. All crates must be stackable and of sufficient structural integrity that stacking will not cause damage to the container or product. Maximum stacking height must be indicated on the container above the shipping weight.
6. Occasionally, there may be a situation where the nature of the component dictates that it cannot be stacked. If this is the case, the vendor must label the crates as “DO NOT STACK” and/or affix a “do not stack” cone to the top of the container.
7. Crates must be banded with metal or plastic banding. A minimum of two bands shall be used in the configuration shown below. Additional bands may be added as necessary in order to help reinforce the crate.



8. Crates with hinged corners and crates comprised of stacked hinged sections are allowed as long as banding is sufficient to support the load. **No more than three stacked sections may be utilized.**



Reusable Containers

1. Clipper supplied - core charge may apply if a vendor requests that Clipper provide containers. Contact Clipper Supply Chain representative for more information.
 - a. Clipper Windpower may supply shipping containers or fixtures to its vendors. These appurtenances remain the property of Clipper Windpower and shall not be used for any purpose contrary to their intent (i.e. Clipper-owned property shall not be used to store material at the vendor's site or to ship product other than it/those for which it was specified).
 - b. If the Clipper-provided container is not deemed suitable for vendor use by the vendor, please contact Clipper Supply Chain for instructions.
 - c. Clipper-provided containers shall be stored indoors or in a covered shelter (minimum three walls and a roof) and out of pooled water at all times. Exceptions must be approved by Clipper Supply Chain.
2. Vendor supplied
 - a. In keeping with the Clipper goal to be environmentally responsible, Clipper encourages all vendors to supply their components in reusable packaging. Clipper will return the containers to the vendor at the **vendor's cost** unless previous arrangements have been made. To arrange, contact Clipper Windpower Logistics or Clipper Supply Chain representative.
 - b. Every effort possible will be made to accommodate requests for container return and to return vendor property when an agreement to do so has been reached. However, there could be extenuating circumstances. 1) In the event that a fixture or container becomes compromised due to normal handling or age, Clipper will not be held responsible. 2) There are also a few instances where the container may need to be discarded in the field and return requests will be denied.
 - c. Vendors shall clearly stencil "RETURN TO _____" in visible, permanent ink or paint on all sides of the container.
 - d. Clipper will only return property if prior arrangements are made.

Center of Balance

If weight distribution is uneven, center of gravity is more than one foot off from the geometric center of the load; center of gravity shall be indicated on the packaging using an arrow and "C.G."

Top heavy loads (center of mass is over the vertical midpoint) shall be labeled as such in prominent lettering on the packaging.



Dunnage Requirements

Dunnage. Components that are shipped loose and subject to shipping damage must be shipped in containers padded with dunnage. See table below for acceptable and unacceptable forms of dunnage.

Acceptable	Prohibited
Polystyrene sheets and moldings	Packing peanuts
Bubble wrap	Shredded paper
Foam cushioning	Material that can easily be caught inside hollow components
Polyethylene foam	
Air-filled bags	
Kraft paper	
Cardboard	

Hardware

1. Refer to Clipper Windpower Hardware Specifications for callouts, standards, and labeling for hardware.
2. Packaging
 - a. Threads on all LOT CONTROLLED studs and bolts 20mm in size and greater must be packaged in cardboard, plastic mesh, or non-absorbent fiber sleeves. Recyclable/recycled materials are favored.
 - b. Uncoated ferrous (black oxide, untreated) hardware (nuts, bolts, washers, etc.) must be protected from corrosion and follow one of these requirements:
 - i. Exterior box must be waterproof OR hardware must be packaged inside a waterproof plastic bag; VCI protection must be used so that all components are protected. This may be in the form of paper between the layers, pads, exterior wrapping, or a combination thereof. Hardware must arrive ready-to-use once packaging is removed. No waxes, sprays, or other product that necessitates chemical removal may be used.
 - ii. Hardware must be lightly coated in oil. The container must be protected from oil damage.
3. Purchase order quantity hardware sized M30 and above must be packed in wood or reusable plastic crates instead of cardboard boxes. Smaller shipments may be packed in cardboard boxes or in plastic or wood crates. Crates must contain a secure fitting lid, four sides, and skids on the bottom. Lids must be secured with wood screws or integrated latches.
4. Packaging must be of sufficient integrity to support the weight of the product.
5. Different part numbers and different lot numbers must not be mixed and must be packaged in different containers.



6. Hardware must be fully enclosed in either a cardboard box (small hardware only) or a crate.
7. When a pallet or crate is packed with containers of more than one part number, containers of like part numbers must be grouped together.
8. When packing hardware in crates, a layer of cardboard or open cell foam must be placed on the floor of the crate to cushion hardware.
9. Hardware sized M20 and above that are not individually wrapped must have interleaving material (VCI paper or Kraft paper) between layers of hardware.
10. Pallets and crates containing hardware **MUST NOT** exceed 2200 lbs. total weight per pallet or crate (includes pallet, dunnage, etc.).
11. Maximum container height, including skids, must not exceed 30".

Bearings

Pitch and Yaw Bearings (excludes all other bearings)

1. Package in crates so that entire bearing is contained in the crate. Yaw bearings shall be packaged one unit per crate. Pitch bearings are to be packaged with one or three bearings per crate.
2. Crates shall have runners constructed of 4X4 minimum dimensional lumber permitting a minimum 3" clearance for forklift access on two opposing sides.
3. Crates shall be constructed using generally accepted construction techniques and be assembled either on-site by the vendor or acquired from a reputable pallet builder.
4. Bearings shall be centered on the floor of the crate.
5. Bearings shall be secured to the crate using one of two methods.
 - a. 4X4 blocking on the inner and outer races, pinning the bearing in place; blocking must be padded with a non-absorbent material; when applied, the blocking must prohibit the bearing from moving more than ¼" in any direction
 - b. Cordura™ or equivalent nylon strapping or cording with weight and tension ratings sufficient to hold the bearing(s) in place during shipping; straps shall be secured using a ratcheting system
6. Crate floor shall be padded with ¼" minimum open cell foam sheeting that is stapled into place. The bearing shall contact this foam only. No bearing surfaces may directly contact the floor of the crate.
7. Lids of wood crates must be secured with wood screws only.
8. Metal or plastic banding, two bands minimum, must be placed around the entire crate as reinforcements. Banding must not interfere with forklift access.
9. Tie down points must be labeled for the shipper.
10. All documentation, including serial number, packing slip, and weight, must be affixed to/labeled on the exterior of the crate.
11. Crates shall be of sufficient structural integrity to allow stacking five high.



12. Bearing teeth (if uncoated) and threaded holes need to be protected from corrosion. This must be accomplished using both of the following techniques:
 - a. Apply VCI liquid to the teeth (if uncoated) and threads. Cortec VpCI-389, Cortec Bio Corr, Fuchs Anticorit, or alternative approved by Clipper; Clipper encourages the use of biodegradable or environmentally safer products
 - b. VCI plastic wrap or paper around the entire bearing; selected VCI wrap must be capable of protecting the bearing metal composition and be secured with tape so that proximity to protected surfaces is guaranteed; use narrow (6–24" wide wrap to permit good conformance to the bearing)

Bearings other than Pitch and Yaw

Package according to manufacturer standards. Protection must be sufficient to guard against mechanical damage and corrosion for six months from time of packaging assuming indoor storage at normal atmospheric conditions. Clipper encourages the use of environmentally friendly technologies and reusable/returnable packaging.

Castings

NOTE: Requirements assume domestic shipments. Contact Clipper Supply Chain for deviations to arrangements and configurations for international shipments.

Machine Base and Hub

1. Unit is to be supported on hardwood cribbing so that no surface makes contact with the ground or the bed of the truck.
2. Edge guards or padding must be used to protect parts against damage from chains and straps during shipping.
3. All loads must be tarped during transit.
4. Holes must be protected against corrosion by one of the following methods:
 - a. Plastic plugs (Caplugs[®] or equivalent) in all threaded and non-threaded machined holes
 - b. VCI liquid (Cortec VpCI-389, Cortec Bio Corr, Daubert Cromwell Nox Rust[®] 9900 or equivalent approved by Clipper) sprayed in all holes
5. Machined surfaces must be protected against corrosion by one of the following methods:
 - a. VCI contact film (Daubert Cromwell Premium Metal-Guard[®], Cortec Cor-Pak masking film or equivalent)
 - b. VCI liquid (Cortec VpCI-389, Cortec Bio Corr, Daubert Cromwell Nox Rust 9900 or equivalent approved by Clipper) sprayed on all surfaces

Gearbox Forward Housing

1. Unit is to be supported on hardwood cribbing so that no surface makes contact with the ground or the bed of the truck.
2. Edge guards or padding must be used to protect parts against damage from chains and straps during shipping.
3. All loads must be tarped during transit.



4. Holes must be protected against corrosion by one of the following methods:
 - a. Plastic plugs (Caplugs or equivalent) in all threaded and non-threaded machined holes
 - b. VCI liquid (Cortec VpCI-389, Cortec Bio Corr, Daubert Cromwell Nox Rust 9900 or equivalent approved by Clipper) sprayed in all holes
5. Machined surfaces must be protected against corrosion by one of the following methods:
 - a. VCI contact film (Daubert Cromwell Premium Metal-Guard, Cortec Cor-Pak masking film or equivalent)
 - b. VCI liquid (Cortec VpCI-389, Cortec Bio Corr, Daubert Cromwell Nox Rust 9900 or equivalent approved by Clipper) sprayed on all surfaces

Gearbox Castings (excluding forward housing)

1. Each unit must be on an individual pallet.
 - a. Pallets must be of sufficient dimension that no part of the casting overhangs the pallet
 - b. Load must be banded to pallet using metal banding; use corner guards or other padding to protect casting from bands
 - c. Pallets must be constructed of lumber of sufficient integrity to support the load; 4x4 runners and 2X6 decking minimum; wood screws or ring shank nails only
 - d. VCI paper (Cortec VpCI-144, Daubert Cromwell Uniwrap, Armor Wrap or equivalent) must be placed between the casting and the pallet so that no part of the casting directly contacts the pallet
2. All loads must be tarped during transit.
3. Edge guards or padding must be used to protect parts against damage from chains and straps during shipping.
4. Holes must be protected against corrosion by one of the following methods:
 - a. Plastic plugs (Caplugs or equivalent) in all threaded and non-threaded machined holes.
 - b. VCI liquid (Cortec VpCI-389, Cortec Bio Corr, Daubert Cromwell Nox Rust 9900 or equivalent approved by Clipper) sprayed in all holes.
5. Machined surfaces must be protected against corrosion by one of the following methods:
 - a. VCI contact film (Daubert Cromwell Premium Metal-Guard, Cortec Cor-Pak masking film or equivalent)
 - b. VCI liquid (Cortec VpCI-389, Cortec Bio Corr, Daubert Cromwell Nox Rust 9900 or equivalent approved by Clipper) sprayed on all surfaces

Small Castings (All non-machine base, hub, gearbox housings)

1. Product may ship either in a crate or on a pallet.
 - a. Multiple units may be packed per crate or pallet.
 - b. Sufficient dunnage must be used to prevent mechanical or cosmetic damage of parts during shipping.
 - c. If components are stacked, full sheets of plywood, OSB, or corrugated plastic, or pieces of dimensional lumber that run the entire width or length of the pallet, must be used



between layers. **No small pieces of wood between components will be accepted.** All materials used must be capable of supporting weight of the product.

- d. Parts must be secured to the pallet using stretch wrap, banding, or both. If banding is used, edge guards or padding must be used under banding.
2. Holes must be protected against corrosion by one of the following methods:
 - a. Plastic plugs (Caplugs or equivalent) in all threaded and non-threaded machined holes.
 - b. VCI liquid (Cortec VpCI-389, Cortec Bio Corr, Cortec VpCI-377, Daubert Cromwell Nox Rust® 9900 or equivalent approved by Clipper) sprayed in all holes.
3. Machined surfaces must be protected against corrosion by one of the following methods:
 - a. VCI contact film (Daubert Cromwell Premium Metal-Guard, Cortec Cor-Pak masking film or equivalent)
 - b. VCI liquid (Cortec VpCI-389, Cortec Bio Corr, Cortec VpCI-377, Daubert Cromwell Nox Rust® 9900 or equivalent approved by Clipper) sprayed on all surfaces
 - c. VCI paper (Cortec VpCI-144, Daubert Cromwell Uniwrap, Armor Wrap or equivalent) contacting all machined surfaces.
 - d. Light oil. This method is discouraged due to disposal concerns presented by petroleum derived products.

Pinions, Gears, and Splines

NOTE: This section applies to pinions, gears, and splined surfaces that are shipped loose and not part of an assembly. Pinions, gears, and splines that are part of an assembly shall be protected as part of the assembly.

1. All surfaces, including holes, must be sprayed with one of the following products or an equivalent rust preventative approved by Clipper:
 - a. Cortec VpCI-377
 - b. Daubert Nox-Rust 9900
2. Gears, pinions, and splines must be tightly wrapped in VCI paper and/or plastic, such as Cortec VpCI-144, Daubert Cromwell Uniwrap, Armor Wrap, Cortec VpCI-126, Daubert Cromwell Metal Guard, or equivalent. Tape must be used to secure the VCI products.
3. In any environment where the product may come in contact with precipitation, plastic must be used as the outermost packaging layer.
4. Parts must be shipped in crates or skids. Crates and skids must provide protection to all gear teeth. The exception is intermediate gears, where the shaft may be protected only by VCI products.
5. VCI plastic or rubber isolators must be placed between the crate and the part so that pinions and gears do not contact wood directly.
6. The parts must be secured in the crates or skids using banding or blocking to prevent movement during shipping and handling. Sufficient padding must be used between the banding or blocking and the parts to protect against mechanical damage. Mesh sleeves may also be used as an added measure of protection. All crates and skids must have runners to permit picking with a forklift.



7. Crates and skids must ship to Clipper in a fully enclosed trailer. This may be a traditional van type unit, sea freight containers, or a "Conestoga" type trailer with a fully enclosed sliding tarp system.

Fabricated Parts

Painted/Coated

1. Components may ship in a crate or on a pallet. Pallets and crates must be of sufficient integrity to support the load. Pallet or crate must have skids to accommodate the use of a fork truck from at least two sides.
2. Interleaving material, sufficient to protect the paint from damage, shall be used in between product and between layers of product.
3. If pallets are used, product must be secured using banding, stretch wrap, or both. If banding is used, edge guards or padding must be used under banding.
4. Care must be taken when packaging to protect painted and machined surfaces as effectively as possible.

Unpainted/Raw

1. Components may ship in a crate or on a pallet. Pallets and crates must be of sufficient integrity to support the load. Pallet or crate must have skids to accommodate the use of a fork truck from at least two sides.
2. Interleaving material, sufficient to protect the product from mechanical damage, shall be used in between product and between layers of product.
3. If components are comprised of ferrous metals, controls to prevent corrosion must be in place. Acceptable methods include:
 - a. VCI paper (Cortec VpCI-144, Daubert Cromwell Uniwrap, Armor Wrap or equivalent) as interleaving material, ensuring that all uncoated ferrous surfaces are wrapped.
 - b. VCI liquid (Cortec VpCI-389, Cortec Bio Corr, Cortec VpCI-377, Daubert Cromwell Nox Rust 9900 or equivalent approved by Clipper) sprayed on all surfaces. Interleaving must still be used to prevent mechanical damage of the product.
4. If pallets are used, product must be secured using banding, stretch wrap, or both. If banding is used, edge guards or padding must be used under banding.

Hydraulic Components

Hoses

1. Package hoses neatly in totes, crates, bins, or boxes. Reusable/returnable containers are preferred. Pallet or crate must have skids to accommodate the use of a fork truck from at least two sides.
2. Cap the ends of all hydraulic hoses.
3. Hoses shall be packaged so that there are no kinks, excessive bends, or twists and hoses may be easily removed from packaging.
4. Label hoses according to documentation provided with the Purchase Order.



Manifolds

1. Cap the ends of all fittings, ports, and orifices.
2. Wrap in dunnage to protect against mechanical and cosmetic damage.
3. Package neatly in totes, crates, bins, or boxes. Reusable/returnable containers are preferred. Pallet or crate must have skids to accommodate the use of a fork truck from at least two sides.

Assemblies (radiators, power units, etc.)

1. Cap the ends of all fittings, ports, and orifices.
2. Use VCI technology as necessary to protect interior and exterior surfaces against corrosion.
3. Wrap in dunnage to protect against mechanical and cosmetic damage. Special care must be taken when packaging valves, gauges, and other components that are easily damaged.
4. Pack on a pallet or in a crate of sufficient size so that the pallet is larger than the largest outer dimension of the unit. Pallet or crate must have skids to accommodate the use of a fork truck from at least two sides.
5. If pallets are used, secure the assembly to the pallet using banding, bolting, stretch wrap, or a combination thereof. If banding is used, edge guards or padding must be used under banding. If stainless steel bolts and nuts are used, lubrication (anti-seize, grease, or equivalent) must be used between the bolt and nut.

Electrical Components and Assemblies

Cabinets/Boxes

1. Affix shipping paperwork and other necessary documentation on the exterior of the unit to prevent unnecessary opening of the cabinet/box.
2. Electrical boxes and cabinets shall be sealed as practicable so as not to allow air exchange with the ambient environment.
3. Dessicant sufficient to protect two times the interior volume shall be placed inside the unit. Dessicant bags and discs are acceptable. Label dessicant with date of installation.
4. VCI emitters (Cortec VpCI-130 series pads, Daubert Cromwell Daubrite[®] foam cushions, Armor Shield VCI foam pads or equivalent) shall be placed in the units to prevent corrosion. Sufficient quantities to protect the interior of the unit shall be used.
5. Boxes and cabinets shall be placed on pallets that are larger than the outside dimensions (length and width) of the unit. Units shall be fastened to the pallet using banding, bolting, stretch wrap, or a combination thereof. If banding is used, edge guards or padding must be used under banding. If stainless steel bolts and nuts are used, lubrication (anti-seize, grease, or equivalent) must be used between the bolt and nut. The method of securing the product to the pallet must be sufficient enough to keep the load secure during normal shipping, handling, and transportation.
6. Dunnage shall be used to protect painted surfaces from mechanical and cosmetic damage.
7. If necessary, a crate shall be constructed around the entire unit if deemed necessary by Clipper to protect the unit from damage.
8. Use bubble wrap or open cell foam to pad all connectors and terminals on the exterior of the cabinet.



Circuit Boards

1. Uninstalled circuit boards must be shipped in sealed anti-static/ESD bags manufactured for the purpose of preventing electrostatic discharge in circuit boards.
2. Wrapped boards must be shipped in a well cushioned cardboard or plastic box. Molded or cut closed or open cell foam must be used as dunnage. Slots shall be cut in the foam to accommodate the boards, and the boards should fit snugly within the foam. The use of reusable containers and dunnage is encouraged.
3. If boards are susceptible to corrosion, VCI emitters (Cortec VpCI-101, VpCI-105, or equivalent) or a combination dessicant/VCI emitter (Cortec Desicorr[®] VpCI or equivalent) shall be placed inside the bags. Alternatively, VCI ESD film (Cortec VpCI-125 or equivalent) may be used as a substitution for both the VCI emitters and the ESD film.

Loose Cables – Connectorized, under 6 feet in length

1. Cables must be neatly packaged in totes, crates, bins, or boxes. Reusable/returnable containers are preferred. Pallet or crate must have skids to accommodate the use of a fork truck from at least two sides. Cables may be packed with other electrical components or assemblies.
2. Cables shall be packaged so that there are no kinks, excessive bends, or twists and hoses may be easily removed from packaging.
3. Cable ends must be covered in bubble wrap, open cell foam or tight fitting covers.

Loose Cables – Over 6 feet in length

1. Cables must be neatly coiled and secured with nylon or equivalent banding.
2. Banding must be of sufficient integrity that each coiled cable may be lifted by a crane using one or two bands only.
3. Cables shall be stacked no more than four high on plastic or wood pallets capable of supporting the load. Open cell foam or cardboard shall be placed between the pallet and cables and layers of cardboard.
4. The entire pallet and contents shall be wrapped in multiple layers (more than two, less than six) of stretch film.
5. Connectorized ends (terminals, ferrules, etc) must be wrapped in either cardboard, foam, or bubble wrap sufficient to protect adjacent cable sheathing from sharp edges and individual wires from damage.
6. Connectorized ends shall be either tucked into the center of the cable bundle or be secured to the outside of the bundle to protect cable sheathing from abrasion or individual exposed wires from damage.
7. The ends of cables with exposed wires or ferruled ends must be wrapped in a way that prevents the individual wires and/or connectors from twisting, bending, pulling, or other mechanical damage.
8. From the ground, the pallet plus load (including skid), must not exceed 40 inches in height.

Miscellaneous Small Parts

This section describes connectors, ferrules, terminals, etc.

1. Parts shall be packaged by part. Each part number must be packaged in a separate container. The quantity of the parts contained must be clearly written on the exterior of each individual container.



2. Multiple part numbers may be shipped in the same box or crate. However, individual part numbers must be individually packaged inside the larger container per the requirements of Part 1 of this section.
3. Dunnage, dessicant, and VCI shall be used as necessary to prevent shipping related damage.

Questions

Any questions about the requirements listed herein or to submit exceptions for Clipper approval, contact Clipper Supply Chain.