

# NORTH AMERICAN PACKAGING STANDARDS

# PACKAGING STANDARDS AND IDENTIFICATION REQUIREMENTS FOR PRODUCTION PARTS

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# Packaging standards and identification requirements for production parts.

#### 1. INTRODUCTION

The purpose of this manual is to provide suppliers with the information needed to develop the most efficient packaging and identification system possible. This manual will allow suppliers to provide packaging for their products and allow shipment to our plants without damage. This manual will also help suppliers choose the most efficient packaging and identification criteria that meets ConMet quality, receiving, and purchasing requirements. In order to limit the size of this manual, these are general guidelines that apply to a broad spectrum of parts and are not meant to define a specific packaging solution. This manual does not override ConMet or OEM specific packaging specifications that may be defined in the design records or supporting documents. When in doubt, contact the ConMet packaging engineering group for direction and or clarification

Due to the competitive nature of our industry, it is imperative to maintain strict standards regarding quality and cost. Defects and errors can be prevented, and it is wasteful to produce good products only to have them rejected due to poor packaging. The goal of this document from ConMet is to define standards that enable our suppliers to improve quality at reasonable costs.

Although it is often taken for granted, packaging is of significant importance to the overall operation. Adherence to these packaging, labeling, and shipping guidelines is mandatory.

#### 2. GENERAL REQUIREMENTS

This manual is for reference to North America only. Each country will have specific rules for disposal/recycling of packaging materials. The supplier should be aware of the rules that govern packaging disposal/recycling for all of the ConMet locations to which they ship. Questions about these processes should be addressed with the appropriate location prior to the initial product shipment.

#### 2.1. ACCEPTABLE SHIPPING CONTAINERS

Unless otherwise specified, suppliers are responsible for designing their own packaging systems. However, when needed, ConMet packaging engineering can assist in developing acceptable shipping system. In such instances, ConMet assumes no responsibility or liability for the design or performance of the container; that responsibility remains solely with the supplier.

#### 2.2. EFFICIENT PACKAGING

Suppliers will suitably design packaging for maximum density, pack quality and pack integrity. Packaging must be stackable, should integrate with the receiving plant's manufacturing cell, and facilitate efficient and ergonomic handling by operators at the receiving plant.

#### 2.3. HAZARDOUS MATERIALS TRANSPORTATION REGULATIONS

When applicable, suppliers must follow the U.S. Department of Transportation's Pipeline and Hazardous Materials Safety Administration (PHMSA) "Hazardous Materials Regulations". Information can be found at <a href="http://www.phmas.dot.gov/hazmat/regs">http://www.phmas.dot.gov/hazmat/regs</a>.

#### 2.4. EXPENDABLE PACKAGING

All expendable packaging materials must be legally and economically disposable. The capabilities of most municipal landfills should be considered in the selection of the expendable packaging materials for sustainability

#### 2.5. PALLETIZING

Pallets must be rack-able, conveyable in four directions and allow 4-way fork truck entry. All material must be palletized to permit handling with industrial trucks when sufficient parts are shipped. Overhang is prohibited. One full layer of cartons is sufficient volume to require that parts be palletized. Any exceptions are mandated by carrier restrictions or regulations (e.g. UPS, air shipments, cab deliveries, parcel post, etc.). Refer to Section 4.1 for pallet construction requirements. (ISPM 15 provisions)

#### 2.6. LOAD LABELS

Suppliers must insure that all materials shipped to ConMet plants are correctly labeled and that the labels are properly attached. Each unit load will require a barcode label (see <a href="Appendix B">Appendix B</a>). If the unit load is a single container, such as a pallet box or a knockdown container, the ConMet standard label is to be applied in two locations. If the unit load is composed of multiple containers secured to a pallet, each container shall be individually labeled and the unit load shall have a master label. The master label shall be identified as such and show the total quantity of parts in the unit load. Suppliers must check with the receiving plant before shipping mixed loads. A mixed load label is required if unitizing more than one part number in the same unit load.

#### 2.7. SECURING CONTAINERS

All containers must be secured to pallets by utilizing banding and/ or stretch or shrink film. When banding is utilized, a minimum of two bands lengthwise and two bands widthwise shall be used to secure the load. Metal banding should be avoided unless poly banding will not suffice due to the weight of configuration of the load. Stretch or shrink films must be applied in a manner such that the load is secured to the pallet, i.e. "roping" and bottom wrapping. ASTM D4649-03 (2009) is the recommended standard for all stretch or shrink films that are used.

#### 2.8. MAXIMUM WEIGHT FOR MANUALLY HANDLED BINS/TOTES

The maximum acceptable weight of manually handled containers is 30lbs. (13.6kg) gross including tare, without exception. The maximum acceptable weight may be less and can vary according to the conveyance mode utilized at the receiving plant. Bins and Totes over the 30# MUST BE IDENTIFIED AS "Heavy on 2 sides of the container.

#### 2.9. STANDARD PACKS/ COUNTS

Standard packs and counts must be established and used. Weigh counting is acceptable only when accurate within +/-0.1%. The quantity per container must be consistent with anticipated shipping schedules, shipping methods and manufacturing procedures — finished good pack size.

#### 2.10. DRUMS, BAGS, BARRELS, PAILS

All drums, bags, barrels, cans, and or pails must be palletized and secured when used. Utilizing these methods for packaging MUST be approved by the receiving plant prior to any shipment.

#### 3. RETURNABLE (COMPOSITE) CONTAINER/ RACK PROGRAMS

In many cases, it is practical to implement a returnable program to reuse shipping containers. In such instances, a predetermined container will be established with the supplier. Depending on the part sensitivity, the supplier and/or ConMet will develop the container specification. In either case, both parties must agree on the container chosen.

Commonly used returnable bulk container footprints include but are not limited to: 48" x 45", 30" x 32", and 48" x 40"

Other commonly used containers include vacuum formed trays with many different footprints that include: 48" x 45", 48" x 40", and 30" x 32"

The maximum acceptable weight of manually handled packs is 30 lbs. (13.6 kg). The minimum or maximum acceptable weight may vary according to the conveyance mode used at the receiving plant. All manually handled packs over 30 lbs. (13.6 kg) need ConMet safety department approvals and all packs must meet all ergonomic lifting requirements. The supplier is responsible to evaluate and maintain the containers in a manner that protects them from damage and contamination and to report any damage via email to the ConMet plant buyer in a timely manner. Ref section 9.1 and 12.4

#### 3.1. INTERNAL DUNNAGE

Internal dunnage used in a returnable program may be returnable or expendable. However, if the part is to be used in a clean area, fiberboard materials must not be used.

#### 3.2. RETURNABLE CONTAINER IDENTIFICATION

- 3.2.1. Returnable containers should be identified in a permanent manner, such as hot stamping or direct molding. ConMet and the supplier will determine the specific nomenclature. Typically this would include a note that reads "Return to" or "Property of" and the location to return the containers. Lettering must contrast the container color and be clearly readable with minimal effort.
- 3.2.2. Totes are to be labeled on the long sides of the tote on both sides.
- 3.2.3. Knock down or fixed sided container labeling is to be either hot stamped on both long sides and/or a non-removable label is to be affixed.
- 3.2.4. Steel racks are to be labeled with 1.5" Alpha/numeric printing to meet the standards of the ConMet location. Additionally, an Alpha/numeric aluminum or steel label is to be affixed to the upper left hand inner front corner of the rack indicating the following information: Manufacture name, address, phone number and a serial number that is unique from all others in the design.

#### 3.3. TRACKING AND LOGISTICS OF RETURNABLE CONTAINERS

- 3.3.1. The tracking and logistics of returnable packaging will typically be the responsibility of one person at each ConMet location. The supplier should contact that person to establish logistics for returnable materials.
- 3.3.2. Returnable packaging identification is being studied and ConMet expects to roll-out a comprehensive plan in the near future, but no system is currently in use. Until a tracking system is developed all containers should be listed on the bill of lading showing the container type, dunnage type if applicable, and amount for each. This is a requirement any time a container leaves your location and includes all ConMet facilities.

#### 3.4. SUPPLIER OWNED CONTAINER IDENTIFICATION

3.4.1. If assigned, all returnable containers, racks, trays, totes, etc. Must clearly identify their container number, proportionate to container size, either embossed into the container or painted in a contrasting color. In addition, supplier owned returnable must have the supplier name and return location clearly marked in proportionately sized letters on the container.

Bar code labels should also be present for scanning to allow for tracking.

#### 3.5. REMOVAL OF PREVIOUS SHIPPING LABELS

3.5.1. Returnable packaging must be cleaned. Removal of previous shipping labels is the responsibility of the supplier. All previous shipping labels are to be removed to ensure the shipping/ production date, current part number, and quantity of material is accurate.

#### 4. EXPENDABLE CONTAINER SHIPPING SYSTEMS

Expendable containers are to be used only one time to ship product from the supplier to a ConMet location. The standard material used for expendable primary packaging is corrugated fiberboard and should only be reused upon approval by the receiving plant and the supplying plant. Expendable pallets are considered to be of wood construction per the National Wooden Pallet & Container Association Standards. Within ConMet plants, there are areas where wood fiber material is not allowed. Suppliers should check with the ConMet receiving plant prior to the initial shipment to see if their parts will be in a sensitive area.

#### 4.1. WOODEN PALLET SIZE AND CONSTRUCTION

- 4.1.1. Pallets must be rack-able, conveyable in four directions and have 4-way fork truck entry. Pallets must follow the conventions outlined in the National Wooden Pallet and Container Association's Uniform Standard for Wood Pallets, retrievable from:
  - https://c.ymcdn.com/sites/www.palletcentral.com/resource/collection/E8AADDDE-7CBA-4298-8341-C7F29D0C14FF/Uniform-Standard-for-Wood-Pallets-2014(REV).pdf
- 4.1.2. Wooden pallets are either stringer pallets or block pallets (Appendix D).
- 4.1.3. Wooden pallet naming convention states the length of the pallet in inches, followed by the width of the pallet in inches. The length of the pallet is defined as the length of the notched stringer. The width is defined as the length of the deck boards. For a 4-way block pallet, the length of the pallet is defined by the stringer deck board length. Common examples are: 48"x40", 42"x42", 36"x36"
- 4.1.4. For stringer-style, non-reversible pallet construction, the primary entry must have a minimum opening of 3.5 inches (90 mm).
- 4.1.5. Deck boards should have a minimum thickness of 5/8" and a minimum width of 3.5".
- 4.1.6. Nailed construction is required using a minimum 2+1/4 inches (57mm) long, screw shanked with a 65 degree threaded angle.
- 4.1.7. Wooden pallets must be heat treated if there is a possibility of them leaving the continental US borders. The heat treatment must be in compliance with ISPM 15.

#### 4.2. BOXES AND CARTONS

4.2.1. The maximum acceptable weight of manually handled packs is 30 lbs. (13.6 kg). The minimum or maximum acceptable weight may vary according to the conveyance mode used at the receiving plant. All manually handled packs over 30 lbs. (13.6 kg) need ConMet safety department approvals and all packs must meet all ergonomic lifting requirements. Boxes and cartons over the 30# limit must be identified as "Heavy" on 2 sides of the container

- 4.2.2. The cartons listed in Appendix C should be considered a guide to delivering product to ConMet plants. It is realized that a general container cannot be stipulated for all components shipped to ConMet plants. If the parts that a supplier is to ship to ConMet will not fit in these containers, a packaging proposal should be made to the specific plant. In such cases suppliers must receive written approval from the ConMet receiving plant prior to shipping.
- 4.2.3. Corrugated containers are to be identified with the Manufactures (BMC) stamp. This stamp is to include all standard information on either the Mullen Bursting Test or the Edge Crush Test. All containers and multi-wall tubes must have a box maker's certificate with ECT rating (or equivalent Mullin burst) visible on the assembled container.
- 4.2.4. The use of packaging materials coated or impregnated with wax or polyethylene must have prior approval of ConMet packaging engineering. Poly bags may be used to reduce contamination.
- 4.2.5. All containers should have glued manufacturer's joint with outside tab construction or proven equivalent performance. Taped or stitched joints are not acceptable unless specified by ConMet.
- 4.2.6. Half-slotted containers with top caps and design style containers are acceptable for certain parts. They must meet the same ECT/Burst requirements per the chart listed in Section 4.4 below.
- 4.2.7. Wood wire bound pallet boxes or wood crates are not acceptable unless specifically authorized in writing.
- 4.2.8. When possible, cartons/containers should be modular to the shipping pallet.
- 4.2.9. Corrugated board used for containers must exceed the minimum test at which it will fail for the weight of the product being shipped. It must withstand the test of usage from the supplier point of manufacture to the ConMet point of use.

#### 4.3. INTERIOR DUNNAGE

- 4.3.1. Dunnage should be selected based on the shipping mode, distance traveled, and container loading and unloading. In most situations corrugated materials are preferred for dunnage. There are situations when corrugated or solid plastics can be used, however the ConMet plant must approve of this prior to initial shipment.
- 4.3.2. Painted and Chromed parts need adequate separation e.g. bubble wrap to prevent parts from rubbing against each other and contacting the outer package. Parts should be packaged in such a manner to ensure Class "A" surfaces are adequately protected from damage.

#### 4.4. CORRUGATED BOARD PERFORMANCE

4.4.1. The chart below provides industry standards for corrugated board performance and is for reference only.

The supplier is ultimately responsible for implementing appropriate packaging that will sufficiently protect the parts during normal handling. (Note: handling includes shipping)

4.4.2. Moisture, contaminants, and other environmental forces can possibly affect the performance of expendable containers.

Corrugated Board Strength Chart Mullen & ECT							
Single Wall Corrugated Board							
Burst Test# Maximum Weight Limit Edge Crush Test							
125#	20lbs.	23ECT					
150#	35lbs.	26ECT					
175#	50lbs.	<b>29</b> ECT					
200#	65lbs.	32ECT					
275#	95lbs.	44ECT					
350#	120lbs.	55ECT					
D	ouble Wall Corrugated	Board					
200#	80lbs.	42ECT					
275#	100lbs.	48ECT					
350#	120lbs.	51ECT					
400#	140lbs.	61ECT					
500#	160lbs.	71ECT					
600#	180lbs.	82ECT					

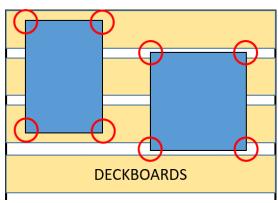
1.4.3. Common Failures for Corrugated Containers

Crushing failure — the formation of "smiley faces" (upside-down arcs along the side panels of the container)

Delamination of liners — the separation of the different layers of the corrugated board

#### 4.5. UNITIZATION OF CORRUGATED CONTAINERS

4.5.1. The first priority for unitization of corrugated containers is to completely fill the surface area of the pallet. OVERHANG IS PROHIBITED. If the corrugated containers do not completely fill the surface area provided, the containers should be unitized in an orientation that both maximizes the containers per layer and the support for the containers on the bottom layer. If the container is designed to carry the load of the containers on top of it, the container should be oriented so that the corners of the container are supported



on the deck boards of the pallet to maximize the strength of the container.

4.5.2. To maximize the strength of the containers, column stacking the containers is preferred.

#### 4.6. CLOSURE

4.6.1. Corrugated containers must be adequately sealed to ensure product protection during handling. Suppliers shipping to ConMet plants should use either poly or paper carton sealing tape. In some circumstances glue may be used, but is not recommended. Staples are not allowed under any circumstances. Components shipped in half slotted containers (HSC) must be covered with caps or tray covers. The covers may have less ECT or burst rating than the container, but must still be capable of withstanding the weight of the product during dynamic loading.

#### 4.7. PERFORMANCE CHARCTERISTICS

- 4.7.1. The maximum weight of any load will vary from plant to plant. The capacity of lift trucks at the shipping point and the type of container being used will determine the limit. Suppliers should contact the ConMet receiving facility to determine maximum load prior to initial shipment. The number of layers on a pallet can be adjusted to keep the weight acceptable.
- 4.7.2. Dynamic loading (in transit) is typically three times the static loading (stacking) weight and must be considered in the design of all packaging. If necessary, corner posts and/ or top boards may be used to supply the needed stacking strength to prevent collapse or other damage.
- 4.7.3. Parts should completely fill the container to prevent collapsing or crushing. Quantity variances should not be utilized, however if it is necessary to ship a non-standard quantity then void fill such as empty cell dividers should be used to ensure carton stack strength. The quality and stability of the standard pack must be maintained for safety as well as preventing loss due to damage. If a non-standard pack is required, the carton must be clearly labeled "Partial Quantity" and the barcode label must also be altered to match the quantity. As partial containers can cause inventory and space problems, it is advisable for the supplier to contact the ConMet receiving plant before such orders are shipped.

## 5. PALLETIZING / UNITIZATION

- 5.1. All containers must be secured to pallets by utilizing banding and/ or stretch or shrink film. When banding is utilized, a minimum of two bands lengthwise and two bands widthwise shall be used to secure the load. Metal banding should be avoided unless poly banding will not suffice due to the weight of configuration of the load. ASTM D3950 and ASTM D3953 serve as standard guides for banding.
- 5.2. Stretch or shrink films must be applied in a manner such that the load is secured to the pallet, i.e. "roping" and bottom wrapping. ASTM D4649-03 (2009) is the recommended standard for all stretch or shrink films that are used.
- 5.3. Maximum load height from the floor to the top of the unit load shall not exceed 42" (1070mm). Suppliers unable to meet the 42" height requirement must contact ConMet packaging engineering for resolution. Only a part size that exceeds 42" may be cause to alter height. The ConMet receiving plant must be notified prior to changes in height.
- 5.4. Where applicable, "DO NOT STACK" Teepee's are to be used.

#### 6. IDENTIFICATION LABELS

Labels may vary between ConMet plants but will have the same general structure. Additional information may be found on the ConMet Supplier Label Requirements document (<u>Appendix B</u>) and/or direct any questions to your contact at the receiving location.

All materials must be identified in compliance with AIAG bar code shipping label specifications. The required label size is 4" (102mm) high by 6" (152mm) wide.

#### 6.1. MULTIPLE COMMON ITEM PACKS

6.1.1. A master label shall be used to identify the total contents of a multiple pack unit load where all sub-packs contain the same part number.

#### 6.2. MIXED PALLETS

6.2.1. Mixed pallets should only be used if requested by a certain plant for cost savings reasons. Suppliers should check with the receiving plant before shipping. A mixed load label is required if sending more than one part number on the same pallet or container. Contact the receiving plant for the required label location.

### 7. PROTECTION OF CRITICAL FEATURES/ SURFACES

All features and surfaces considered critical to the quality or operation of the part (e.g. machined surface, finished surface, electrical connector, painted surface, etc.) are to be protected from damage, buffing, and/ or contamination by dirt, sediment, moisture, wood fiber, and/ or other debris. For specific details on component features refer to the ConMet print. It is the responsibility of the supplier to insure the integrity of the part is maintained when implementing such measures.

#### 8. SHIPPING HAZARDS

Consideration must be given to all hazards encountered in the distribution environment. The following terms represent hazards that are typically found in the shipping environment. The methods detailed in ASTM D5728 may help reduce these hazards

#### 8.1. SHOCK

8.1.1. Shock forces are intermittent forces caused by dropping the package to the floor, stack tipping over, bump in the road, or any number of other causes. Express carrier or small package delivery systems represent the most severe environment for shock hazards.

#### 8.2. VIBRATION

8.2.1. Vibration forces are continuous forces applied to the packaging whenever it is physically transported.

Airplanes, trucks, and conveyors will impart some level of vibration to the package.

#### 8.3. COMPRESSION

8.3.1. During shipping, handling, and storage packages will be subjected to dynamic and static compression due to stacking. Compression strength diminishes considerably in humid/moist environments and when the stacks are not aligned or overhang the shipping pallet. Packages or containers must withstand dynamic stack height of at least 2.5m (8 feet) since this is how high they will be stacked in trucks and other vehicles. Furthermore, packages or containers stored in a warehouse should be able to withstand static stack heights of 5.0m (16 feet), measured from floor to top of stack, for a period of 30 days without visible degradation to

any package or container or its contents. Shippers should incorporate a 5-1 safety factor into their package design to allow for warehouse stacking up to 16 feet.

#### 8.4. TEMPERATURE

8.4.1. Products may encounter temperature extremes ranging from - $40^{\circ}$ C (- $40^{\circ}$ F) to over + $60^{\circ}$  C (+ $140^{\circ}$ F) in the distribution environment. Packaging materials and methods must be effective at these extremes as well.

#### 8.5. MOISTURE

- 8.5.1. Moisture sensitive items may need to be packaged in hermetically sealed barrier materials with desiccant. Conversely, if desiccant is not used it is best not to seal the bags. Avoid the use of packaging materials inside the sealed barrier bags that contain or have the ability to absorb moisture.
- 8.5.2. NOTE: All ocean shipments of moisture sensitive items require some form of moisture protection. Examples of such materials are as follows:

Desiccant materials used are as follows:

Clay, silica gel, indicating silica gel, molecular sieve, and activated carbon

- 8.5.3. (Desiccant pouches need to be sized for the cubic size of the container and type of material in the container)
- 8.5.4. VCI film-Volatile Corrosion Inhibitor = gaseous corrosion protection. (from the carrier material)
- 8.5.5. VPCI paper CPCI paper works the same way VCI film works. Vapor Corrosion Inhibitors work by diffusing corrosion inhibiting molecules from a source (packaging film or paper for example) to metal surfaces. These molecules settle on metal surfaces and form a protective corrosion inhibiting layer that inhibits the electrochemical reactions that cause corrosion to form.

#### 8.6. PACKAGE TESTING

- 8.6.1. The package must provide enough protection to ensure its contents arrive damage free. Certified testing by a third party is ConMet's preferred method of testing for new product lines and/or class "A" product. Listed are a few of the sources that maybe used, these are suggestions only, Smithers Pira, Westpak, and Keystone Compliance. Testing that may apply are as follows:
  - ISTA 1 Series: Integrity tests for screening
  - ISTA 2 Series: General simulation with atmosphere or random vibration
  - ASTM D642: Standard Test Method for Determining Compressive Resistance of Shipping Containers, Components, and Unit Loads
  - ASTM D999: Standard Test Methods for Vibration Testing of Shipping Containers
  - ASTM D1185: Standard Test Methods for Pallets and Related Structures Employed in Materials Handling and Shipping
  - ASTM D4169: Standard Practice for Performance Testing of Shipping Containers
  - ASTM D4577: Standard Test Method for Compression Resistance of a Container Under Constant Load
  - ASTM D5331: Standard Test Method for Evaluation of Mechanical Handling of Unitized Loads Secured with Stretch Wrap Films

- ASTM D5414: Standard Test Method for Evaluation of Horizontal Impact Performance of Load Unitizing Stretch Wrap Films
- ASTM D6344: Standard Test Method for Concentrated Impacts to Transport Packages
- ASTM D6537: Standard Practice for Instrumented Package Shock Testing For Determination of Package Performance
- MIL-STD-810: Transportation Profiles
- Vendor specific Specification

#### 8.7. ELECTROSTATIC DISCHARGE (ESD) PACKAGING REQUIREMENTS

- 8.7.1. ESD is one of the most pervasive hazards for electronic components. Static discharges of less than 50 volts can destroy or weaken (latent damage) electronic components. AS a point of reference, people cannot feel a static discharge of less than 3,000 volts. This is why it is critical to consistently handle these parts in a static safe manner and use packaging materials that can protect against these hazards.
- 8.7.2. All electronic parts will be treated as ESD sensitive regardless of the part's actual level of ESD sensitivity. This will eliminate confusion regarding when to apply proper protective techniques.
- 8.7.3. The best method for packaging ESD sensitive parts is to use static dissipative material closest to the ESD sensitive part. A conductive material is then used to surround the ESD sensitive item to provide an electrostatic shield (faraday cage). All portions of a package assembly used with ESD sensitive parts must be non-insulating even if the part is already inside one of the conductive or shielding layers.
- 8.7.4. All packaging materials used for ESD protection must meet the requirements specified in EIA standard EIA-541.
- 8.7.5. (http://tia.nufu.eu/std/EIA-541)

#### 8.8. STATIC SHIELDING BAGS

8.8.1. Static shielding bags are multi-layer bags that have a static dissipative material next to the ESD sensitive item along with a thin outer metallic layer.

#### 9. DISPOSITION OF DAMAGED MATERIALS

To ensure fast, accurate disposition of material damaged due inadequate packaging, ConMet will contact the product supplier for resolution. The supplier is responsible for all necessary corrective action. Damage determined as carrier responsibility will be filed against the delivering carrier.

#### 9.1. DISPOSITION OF DAMAGED CONTAINERS

Containers that are ConMet owned, and damaged must be RED TAGGED, returned to ConMet for disposition. State the concern with the container and the location of the concern on the RED TAG.

#### 10.STANDARD PARTS

- 10.1. Standard small parts are any nuts, bolts, screws, washers, small fasteners or similar dense material. All small parts must be shipped in containers weighing no more than 30lbs. (13.6kg) gross weight. Containers are of three primary recommended designs:
- 10.1.1 Regular slotted cartons with an inner liner if necessary.
- 10.1.2 Returnable tote containers that fit standard pallet sizes.
- 10.1.3 Custom trays that orient parts for delivery.

#### 11 ConMet's PACKAGING RESPONSIBILITY

#### 11.1 ECONOMIC FEASIBILITY STUDY

When negotiating the price of a component, supply chain management will coordinate an economic feasibility study prior to negotiating cost to assure acceptable return on investment.

#### 11.2 PACKAGING DESIGN

Coordinate the packaging designs between the receiving plant, engineering (when needed), and supplier, evaluate what is necessary for total system needs (e.g., quality, safety, cost, manufacturing, transportation, assembly, etc.) to be met.

#### 11.3 RETURNABLE PACKAGING

Decide quantity and distribution of returnable shipping containers required for a JIT loop. Under no circumstances will ConMet be responsible for supplying containers used for in-process work at the supplier.

#### 12 SUPPLIER REQUIREMENTS

#### 12.1 SUFFICIENT SUPPLY

Maintain sufficient supply of expendable packaging to be used for premium shipments, production run-ahead programs, container shortages, and other similar circumstances. Require expendable supplier to maintain packaging to sustain a week of production.

#### 12.2 CLEANLINESS

It is the responsibility of the supplier to deliver clean parts. If the ConMet drawing requires parts to meet a certain level of cleanliness per ConMet Cleanliness Specification, the supplier must ensure that the method of packaging such parts will allow compliance to the specification. Visual Quality Acceptance levels must be considered as this is part of the drawing specifications. It is also advisable that the supplier keep containers clean to reduce potential contamination. If this is not a normal practice then it should be discussed with ConMet during negotiations.

#### 12.3 TRACEBILITY

Maintain continuous shipping and receipt records of returnable packaging which shows the location of all consigned material, including supplier in-plant reserve and balance not returned to ConMet. If a returnable

container program is initiated, a returnable container inventory must be taken at the end of each month and be reported to the materials department of each plant by the fifth day of the next month.

#### 12.4 TRANSPORT

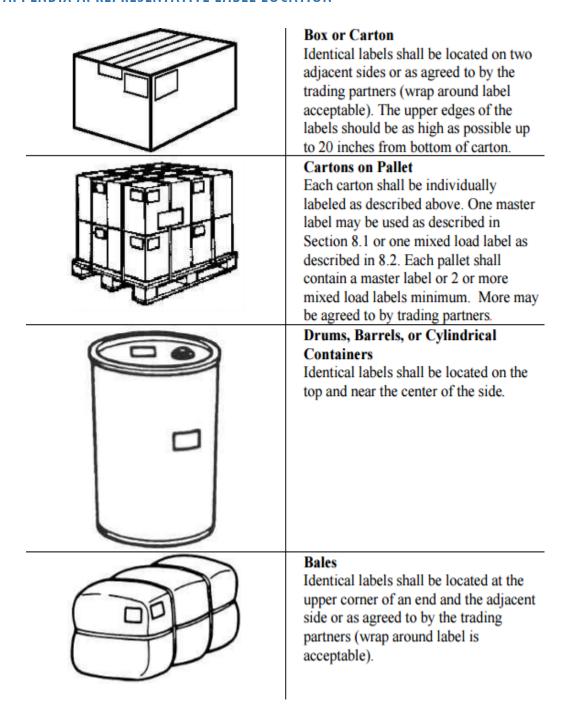
Load production parts in containers and then into transportation equipment in a manner which maintains part quality and cleanliness. Inspect each returnable container for debris or foreign material and if applicable clean containers. Containers should also be checked regularly for damage which compromises the structural integrity. Do not use damaged containers. If the supplier is unsure whether a container is suitable for shipping parts, contact the ConMet receiving plant for instructions and/ or disposition. The supplier is responsible to evaluate and maintain the containers in a manner that protects them from damage and to report any damage via email to the ConMet plant buyer in a timely manner.

#### 13 PACKING SLIP AND BILL OF LADING REQUIREMENTS

A packing slip, prominently displayed, must accompany each shipment and contain the following information:

- Date shipped
- Carrier (shipped via)
- Description
- Part number
- Revision level
- Supplier manufacturing lot number, by part number by pallet
- Quantity and unit measure as shown on ConMet purchase order
- Number of containers shipped
- Bill of lading number if different from the packing slip number
- Weight shipped

#### APPENDIX A: REPRESENTATIVE LABEL LOCATION



# APPENDIX A: REPRESENTATIVE LABEL LOCATION

Basket, Wire Mesh Container Identical labels shall be located on two adjacent sides or as agreed to by the trading partners.
Metal Bin or Tub  Tag one visible piece near top, or use a label holder or as agreed to by the trading partners.
Pallet Box Identical labels shall be located on two adjacent sides or as agreed to by the trading partners (wrap around label is acceptable).
Telescopic or Set-Up Containers Identical labels shall be located on two adjacent sides of the outer box or as agreed to by the trading partners. Some applications may also require identification of the inner box (wrap around label is acceptable).

# APPENDIX A: REPRESENTATIVE LABEL LOCATION

Bundle Identical Tags shall be located at each end.
Bag Place one label at the center of face.
Roll This example is no longer appropriate. If used, must be in a container labeled on 2 adjacent sides or as agreed to by the trading partners.
Rack This example is no longer appropriate. If used, must be labeled on 2 adjacent sides or as agreed to by the trading partners (may require 2,3, or more labels).

#### APPENDIX B: SUPPLIER LABEL REQUIREMENTS

CONSOLIDATED METCO INC.

Corporate Office:

5701 SE Columbia Way Vancouver, WA 98661

# **SUPPLIER LABEL REQUIREMENTS**

#### **SUPPLIER LABEL REQUIREMENT**

**Rev. 07** 

#### **AUTHORIZATION**

Corporate Director- Supply Chain
Jason Smith

Corporate Materials Manager
Patricia Bernard

Date: 04/13/2016

The information contained in this document is proprietary information and may not be disclosed to others without prior written approval from Consolidated Metco

#### **Chronology of Revisions to This Document**

Date of Change Revision No.		Description of Change	
12/10/2013	00	Initial release.	
12/17/2013	01	Changes to Data Label chart and label examples	
12/20/2013	02	Updates to terminology in Data Label, updates to technical specifications of 2D code	
1/6/2014	03	Correction to Master Label example	
01/08/2014	04	Addition of default wording for reference to <a href="https://www.conmet.com">www.conmet.com</a> for proper rev. level	
06/22/2015	05	Update to 2D barcode and added definitions	
2/26/2016	06	Update barcode symbology to Data Matrix from PDF-417. Include new Mixed Master and Small Container	
04/13/2016	07	label. Update to wording, definitions, and label examples. Deleted Small container MIX Load labels.	

#### Introduction

The following label requirements are required for all suppliers of production materials entering a Consolidated Metco facility.

Requirements are specific to ConMet and developed in conjunction with AIAG Standards.

Compliance is mandatory and will be monitored. Non-compliance is subject to rejection by our receiving locations. Exceptions to the guidelines may be permitted in limited situations with prior written request to the receiving location.

For further information on ConMet requirements, g to <a href="www.conMet.com">www.conMet.com</a>. For Automotive Industry Action Group (AIAG) information and publications, contact them at (248) 358-3003 or through their website <a href="www.aiag.org">www.aiag.org</a>.

#### A. Packaging Labels

#### **Identification and Requirements**

- The printing format, quality and application of labels shall be in agreement with AIAG's B-10 Trading Partner Labels
  Implementation Guidelines, unless noted otherwise in this document.
- Suppliers must ensure all parts and material are correctly labeled and labels are properly attached.
- Labels must meet all requirements in the Label Table Data and Specifications in this document.
- 2D Barcode is Data Matrix based on ANSI-1252 or ISO/IEC 8859-1 encoding.
- 2D Barcode Symbology further detailed in this document.

#### **Label Size and Materials**

- Required label size is a minimum 4.0 inches high by 6.0 inches wide for Master, Mixed, and standard Container labels.
  - The minimum size for a container is 8 x 6 x 4; sufficient to hold both the ConMet required label and any small package carrier's label (i.e. UPS, FedEx, US Postal Service), with no overlap.
- Label paper shall be white with black printing.

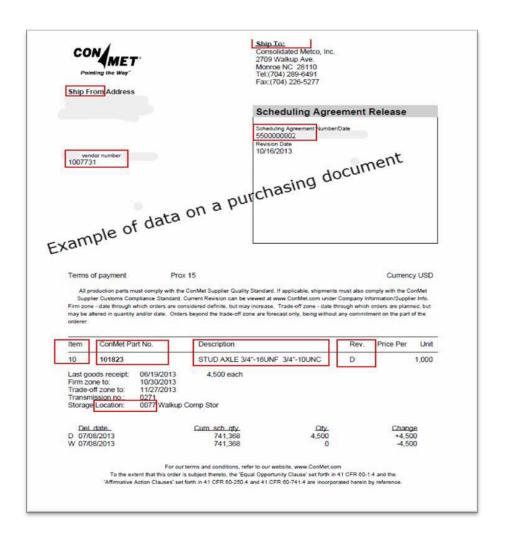
#### Placement and Protection

- Labels are to be secured on a flat readable surface, and protected against moisture, weather and abrasion. Laminates, sprays, window envelopes, and clear plastic pouches are examples of possible protection methods.
- Returnable packaging may have specific designated areas for the placement of barcode labels. When a specific area is not
  provided, the bottom edge of the label should be parallel to the base of the skid, and the top edge of the label, where possible,
  should be a minimum of 20 inches from the bottom of the skid.
- Suppliers are responsible for removal of old labels prior to shipment.
- Placement of labels must be consistent.

#### Label Data (Data ID Characters)

- All products must be identified with the fields stated in the Label Data Table.
- No alternative data is permitted.
- A data identifier shall be used as defined in the current ANSI FACT-1 Data Identifier Dictionary.

#### Sample of CMI Purchasing Document for proper identification of Field Names.



Field Names	<u>Description</u>	Container Label	<u>Master</u> <u>Labe</u> l	<u>Human</u> Readable	In <u>2D</u> Barcode	ID code for 2D Barcode	<u>Comments</u>	Arial Font (Bold) and Point Size
ASN#	Advanced Shipping Notification Number		A	A	Å	9K	Only required if using ConMet applicable process (i.e. ConMet TMS)	12
CMI Part#	ConMet Designated Part Number on Purchasing Document	ŝ	奇	寿	Å	P		54
Header	Master Label Title Block		₿	Å				40
ltem	ConMet Designated Item Number on Purchasing Document		À	奇	寿	4K	Located on CMISA / PO. Referred to as Line or Item Number	20
Loc	4 Digit "Storage Location" (if available)		Å	Å			Leave blank if not provided on Purchasing Document	20
Lot	Supplier Lot Number	Å	壽	虏	鸢	11	Traceability number assigned to a unique batch or group of items (lot, heat, and batch) by the vendor	14
MFG Date	Date Parts Were Manufactured	Å	Å	Å				14
Part Description	ConMet Designated Description	Å	Å	壽			Description provided on purchasing document (as will fit)	12
PO #	ConMet Designated Purchasing Document Number		À	Å	Å	К	Sometimes referred to as a scheduling agreement (SA)	20
Qty	If Container label, the part qty in a single receptacle  If Master label, the sum of the part qty for all containers on that skid.	A	Å	Å	Å	Q	See specific requirements	26
Rev Level	Revision Level the Part was Produced to	À	A	Å			Be aware this may be "—"	14
Serial # (Label)	Unique Number Assigned by Supplier to Prevent Duplicate Labels		A	虏	鸢	S	Label Serial number must be unique and shall not be repeated within a minimum of 366 days	12
Ship From	Suppliers Name, Street Address, City, State, Zip, Country	À	À	為				8
Ship To	ConMet Delivery Location		À	奇			As stated on purchasing document	14
Shipment ID	Number Assigned by Supplier that Specifically Identifies a Shipment		Å	奇	奇	25	The same number must be referenced on the Invoice and Packing Slip/BOL	18
UOM	Unit of Measure	Å	À	Å				12
Vend Part #	Vendor Part Number (optional)	À	À	奇	\$	1P	If different than CMI part number	16
Vendor#	ConMet Designated "Vendor Number"	À	₿	Å	Å	V	Provided on Purchasing Document	16

#### Master Label

- Master Labels are required on each pallet of parts, tote, or similar conveyance (further known as a skid).
- Master Labels are critical for receiving, inspection, traceability and payment processing.
- Identical Master Labels should be located on two adjacent sides of each skid, outside of stretch wrap.
- If the skid is stretch-wrapped, one master label should also be placed on inside of wrap.
- Shipping multiple part numbers on a skid is discouraged, see "Mixed Load Labels" section of this document.
- Shipping multiple lot numbers of the same part number on a skid is prohibited.
- Skids that are not containerized, require only a Master Label(s).
- \*\* A Container is defined as a single box or small tote containing a single part number. There may be multiple containers on one skid.

#### Master Label - 2D Barcode — Data Matrix



#### Minimum requirements:

Narrow Width/Xdim = 30-35mils, Encoding = US Western Europe (ANSI, 1252) or US Western Europe (ISO/IEC 8859-1), Shape = Square, Symbol Type = ECC 200

#### Field ASCII HEX/Decimal

Compliance Indicator [)> 5B, 29, 3E / 91, 41, 62
Format Trailer Indicator @ 40 / 64
Data Field Separator @ 40 / 64
Message Trailer @@ 40, 40 / 64, 64

#### Example 2D-Code Data Matrix:

Message Header [)>@

Format Header M@ (M for Master label) Formatted user data

P10001234@Q999@K5500000001@4K10@V1234567@2S80000001@1PVPART1234@S8000000100101@1TA234567

89012345@9KASN4567890

Format Trailer @ Message

Trailer @@

Field qualifiers for all fields must be in the 2D barcode. For any field that is not used or blank, send the field qualifier only. No spaces or any other characters are allowed. For example, if there is no ASN #, the barcode section for the ASN should read @9K@.

[)>@M@P10001234@Q999@K5500000001@4K10@V1234567@2S80000001@1PVPART1234@S8000000100101@ 1 TA23456789012345@9KASN4567890@@

Master Label Sample & Placement (Not to scale)

# MASTER LABEL

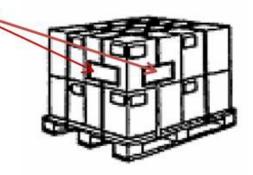
Ship To Name Ship To Address City, State, Zip



10001234

Part Description
Part Description

Qty	UOM	PO#	Item			
999	EA	550000000	1 10			
Shipment ID <b>8000001</b>		ຶ້0010	Lot <b>A234</b>	56789012345		
Vendor# Vend Par VPA		RT1234	MFG Date 02	2/26/2016		
Serial # 80000000100101	ASN# ASN4	Rev Level	A			
Ship From: Vendor Name, Address, City, State, ZIP, Country Code						



- 2. <u>Container Label</u> \*\* A Container is defined as a single box or small tote containing a single part number. There may be multiple containers on one skid.
  - If a skid consists of multiple boxes, totes, etc. each one requires a container label.
  - Container Labels are critical for traceability and inventory management.
  - Identical Container Labels should be located on two adjacent sides of each container.
  - Shipping multiple part numbers in one container is prohibited.
  - Shipping multiple lot numbers of the same part number in one container is prohibited.

#### Container Label - 2D Barcode — Data Matrix



Minimum requirements:

Narrow Width/Xdim = 30-35mils, Encoding = US Western Europe (ANSI, 1252) or US Western Europe (ISO/IEC 8859-1), Shape = Square, Symbol Type = ECC 200

#### <u>Field ASCII HEX/Decimal</u>

Compliance Indicator [)> 5B, 29, 3E / 91, 41, 62
Format Trailer Indicator @ 40 / 64
Data Field Separator @ 40 / 64
Message Trailer @@ 40, 40 / 64, 64

Example 2D-Code Data Matrix:

Message Header [)>@

Format Header S@ (S for container labels)

Formatted user data P10001234@Q999@V1234567@1PVPART1234@1TA23456789012345

Format Trailer @
Message Trailer @@

Field qualifiers for all fields must be in the 2D barcode. For any field that is not used or blank, send the field qualifier only. No spaces or any other characters are allowed.

10001234

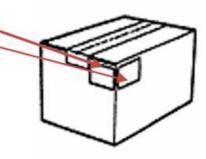


Part Description

999 EA

Vendor # 1234567 VPART1234 Lot A23456789012345
MFG Date 02/16/2016
Rev Level A

Ship From: Vendor Name, Address, City, State, ZIP, Country Code



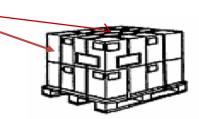
#### 3. Mixed Load Labels

Shipping multiple part numbers on a skid is discouraged but may be unavoidable due to low order quantities and/or shipping expense.

- Mixed Load labels must be attached to any skid containing more than one part number.
- A Mixed Load label must be attached on adjacent sides of the skid and not cover the Master labels or Container labels.
- On a Mixed Load: Multiple Master Labels are required for each part number, with the total quantity of that part on the unit load.
- Human readable text only.

#### Mixed Load Label Sample & Placement (Not to scale)





\*\* If the size of your standard shipping package or individual containers cannot accommodate a standard 4 x 6 label, please contact
VendorLabelReview@ConMet.com for further instructions.

#### B. Product Labels

#### I. Rotors

- Brake Rotor components are to be individually labeled. (1 label per part)
- Label should be adhered to the machined face (friction surface), on the side facing "up" as the rotors are packaged.

#### **Label Size and Materials**

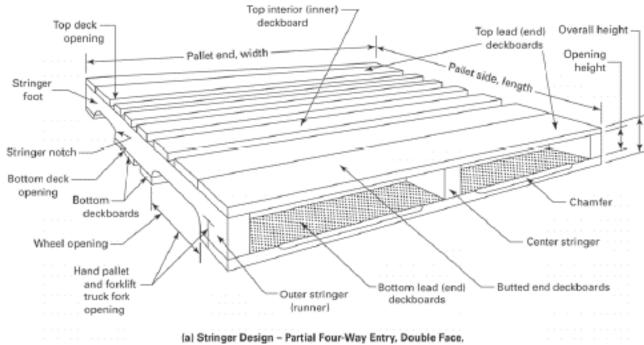
- Height: .5 inches (1.25 cm) Width: 1.75 inches (4.5 cm)
- Label paper shall be white with black printing.
- Label material should be selected to ensure proper adhesion and ink retention.

#### **Rotor Label Content**

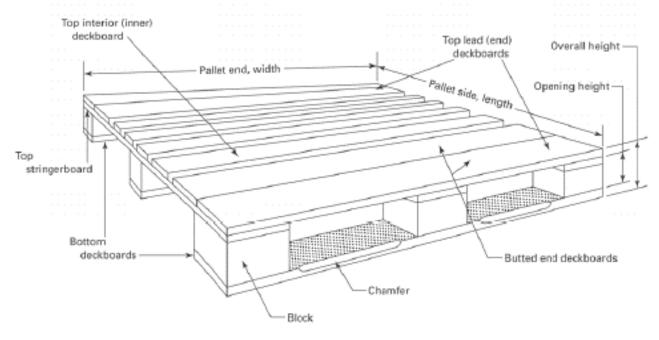
1: Code 39 (Full ASCII) Barcode for ConMet part number. 2: Human readable ConMet part number.

#### **APPENDIX C: WOODEN PALLETS**

#### Images Pulled from ANSI —MH1



Nonreversible, Flush



(b) Block Design - Full Four-Way Entry, Double Face, Nonreversible, Flush

The following size pallets are considered standard. All pallets must have 4-way entry

- 35" x 42"
- 38" x 44"
- 32" x 30"
- 42" x 42"
- 42" x 48" (pallet size for drums)
- 48" x 40"
- 52" x 42"
- 48" x 45"

If other sizes are required the supplier must get approval from the receiving plant.

The table below provides examples of containers that maximize the number of containers per lay for the respective pallet sizes.

Pallet Size	Examples of Efficient Expendable Container Inside Dimensions (minimum height of 5", increasing in 2" increments)
48" x 45"	23" x 11", 23" x 22", 47" x 22"
52" x 40"	25" x 13", 25" x 19", 51" x 19"
35" x 42"	17" x 10", 17" x 20", 34" x 20"

## **Metric Conversion Chart**

	Into Metric			Out of Metric	
If you know	Multiply by	To Get	If you know	Multiply by	To Get
Length			Length		
inches	2.54	centimeters	millimeters	0.04	inches
foot	30	centimeters	centimeters	0.4	inches
yards	0.91	meters	meters	3.3	feet
miles	1.6	kilometers	kilometers	0.62	miles
Area			Area		
sq. inches	6.5	sq. centimeters	sq. centimeters	0.16	sq. inches
sq. feet	0.09	sq. meters	sq. meters	1.2	sq. yards
sq. yards	0.8	sq. meters	sq. kilometers	0.4	sq. miles
sq. miles	2.6	sq. kilometers	hectares	2.47	acres
Mass (Weig	yht)		Mass (Weight	:)	
ounces	28	grams	grams	0.035	ounces
pounds	0.45	kilograms	kilograms	2.2	pounds
short ton	0.9	metric ton	metric tons	1.1	short tons
Volume			Volume		
teaspoons	5	milliliters	milliliters	0.03	fluid ounces
tablespoons	15	milliliters	liters	2.1	pints
fluid ounces	30	milliliters	liters	1.06	quarts
cups	0.24	liters	liters	0.26	gallons
pints	0.47	liters	cubic meters	35	cubic feet
quarts	0.95	liters	cubic meters	1.3	cubic yards
gallons	3.8	liters			
cubic feet	0.03	cubic meters			
cubic yards	0.76	cubic meters			
Temperatu	re		Temperature		
Fahrenheit	Subtract 32, then multiply by 5/9ths to get	Celsius		fultiply by 9/5ths, then dd 32 to get	Fahrenheit

# APPENDIX E: ALTERNATIVE PACKAGING APPROVAL REQUEST

## Alternative Packaging Approval Request

Supplier Name:	
Supplier Name: Address:	
Contact Person:	
Phone Number:	
Part Number:	
Dance Albertative Device Needed	
Reason Alternative Packaging Needed:	
Type of Material used in Alternative Packaging:	
ConMet Associate contacted:	
Date Contacted ConMet:	
Total Cost of Alternative Packaging if ConMet Cost: \$	
Approved By:Date Approved,,	
ConMet Purchase Order Number assigned for Packaging:	
Total Number of Back Office and	
Total Number of Parts Effected: Ending Date of Alternative Packaging Use,	J

#### APPENDIX G: NEW MODEL LABEL



PACKAGING SAMPLE PARTS

# APPENDIX H: PPAP APPROVAL SAMPLE PARTS

MAKE SURE TO PUT THIS LABEL ON PPAP PACKAGE				
Supplier Name Supplier Location:	0		-	
ConMet Part Number:	0	ConMet Revision #	0	
Quantity of Parts:		ConMet Location:		
PO Number:		Date of Shipment:		
Correction of Non-conformal Change to optional consistency Submittal New Supplier, New mate Change of supplier, main New process or a change of manufacturing Other - please specify  Supplier: Attach this label to the outside Enclose the PPAP documentation Label size should be a min of 4	ew/Revised drawing or acement (new), refurbing or discrepancy struction, material or content or new source for terial or non-equivalent in production procesting location, sub-supplies of the packaging whom records with the Pitrace with a Yellow in the pitrace of the packaging whom records with the Pitrace with a Yellow in the pitrace of the packaging whom records with a Yellow in the packaging whom the packagin	other specification shment, modified or additional component existing material t materials/services s or method	PAP@conmet.com of the container	
ConMet OA Manager or designee				

## **APPENDIX I: PPAP APPROVAL SAMPLE PARTS**



# **BLANK FOR NOTES**