SUPPLIER QUALITY AND PACKAGING REQUIREMENTS MANUAL

Commercial Vehicle Group
7800 Walton Parkway
New Albany, Ohio 43054
Phone: 614-289-5360
**CVG Supplier Quality and Packaging Requirements Manual**

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GENERAL INFORMATION

All requirements and standards stated in this Supplement pertain to those specific requirements of CVG. All references to Commercial Vehicle Group refer to CVG facilities (CAB Systems, Seating, Electrical, and Specialty Products). All suppliers shall obtain a copy and must comply with the Quality Management System Requirements of ISO 9001:2008 (and possibly ISO/TS 16949:2009) as supplied by the AIAG (Automotive Industry Action Group) in Southfield, MI (www.aiag.org) phone (248) 358-3003.

Other reference books needed to comply with the technical specification referred to and available through the AIAG are: Advanced Product Quality Planning and Control Plan (APQP/CP), Failure Mode and Effect Analysis (FMEA), Measurement System Analysis (MSA), Fundamental Statistical Process Control (SPC), and Production Part Approval Process (PPAP).

A. Definitions
All statements contained within this document referring to Supplier refer to your company regardless of sourcing arrangements. All statements referring to Subcontractor (or Sub-supplier) refer to providers of materials, parts, or services to the supplier. All statements referring to “CUSTOMER” refer to the CVG facility. All statements, which refer to “CORPORATE QUALITY”, shall henceforth refer to CVG - Corporate Supplier Quality Assurance and Development Department.

B. Supplier Requirements
Suppliers to CVG are required to be third party registered, at a minimum, to the quality standard of ISO 9001:2008, and ultimately (if eligible), compliant to the ISO/TS 16949:2009 standard. This requirement applies to every location of each supplier providing goods or services which is present in the final CVG product sold to CVG’s customer’s (to include packaging and tooling).

In the case of multiple sites, the supplier shall maintain all relevant documentation of such certification and provide in response to CVG inquiries within 24 hours of a request. All materials must be processed, controlled, inspected and/or tested in accordance with requirements as presented in the ISO 9001:2008 standard, this addendum, supply agreements, purchase orders and any other requirements stated on CVG documents.

CVG Supplier Requirements is a supplement to the quality standard ISO/TS 16949:2009 which defines the guidelines for meeting CVG specific requirements to the supply base.

C. Supplier Development
In the event that third party registration is an extreme burden to the supplier, a supplier development program is an alternative, under certain conditions. A supplier may apply to the CVG Corporate Quality Group for consideration of the circumstances and the need for the product(s) produced by the supplier.

If it is determined that circumstances warrant, arrangements will be made for a second party evaluation of the ability of the supplier to become compliant to the requirements of ISO 9001:2008. Recommendations will then be made for any corrective action needed and after they are implemented, a second party compliance certification will be given to the supplier.
### D. Corporate and Plant Listings

**Commercial Vehicle Group Corporate Headquarters**

7800 Walton Parkway  
New Albany, OH 43054  
Phone (614) 289-5360  
Fax (614) 289-5361

<table>
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<tr>
<th>Location</th>
<th>Address</th>
<th>Phone</th>
<th>Fax</th>
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<tr>
<td>Concord, NC</td>
<td>2845 Armentrout Drive, Concord, NC 28025</td>
<td>(704) 784-2100</td>
<td>(704) 784-1605</td>
</tr>
<tr>
<td>Dublin, VA</td>
<td>320 Newbern Road, Dublin, VA 24084</td>
<td>(540) 674-6229</td>
<td>(540) 674-6427</td>
</tr>
<tr>
<td>Statesville, NC</td>
<td>2227 Salisbury Hwy., Statesville, NC 28625</td>
<td>(704) 872-4646</td>
<td>(704) 873-4613</td>
</tr>
<tr>
<td>Vancouver, WA</td>
<td>6211 Northeast Campus Drive, Vancouver, WA 98661</td>
<td>(360) 696-9060</td>
<td>(360) 696-8986</td>
</tr>
<tr>
<td>Shadyside, OH</td>
<td>60581 State Route 7, Shadyside, OH 43947</td>
<td>(740) 676-6542</td>
<td>(740) 676-9273</td>
</tr>
<tr>
<td>Michigan City, IN</td>
<td>527 West Highway 20, Michigan City, IN 46360</td>
<td>(219) 861-2500</td>
<td>(219) 879-4578</td>
</tr>
<tr>
<td>Vonore, TN</td>
<td>20 National Drive, Vonore, TN 37885</td>
<td>(423) 884-6651</td>
<td>(423) 884-6126</td>
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<tr>
<td>Dekalb, IL</td>
<td>310 Dietz Street, Dekalb, IL 60115</td>
<td>(815) 756-8225</td>
<td>(815) 756-8227</td>
</tr>
<tr>
<td>Chillicothe, OH</td>
<td>75 Chambers Drive, Chillicothe, OH 45601</td>
<td>(614) 772-5998</td>
<td>(614) 775-1400</td>
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<tr>
<td>Piedmont, AL</td>
<td>50 Nances Creek Boulevard, Piedmont, AL 36272</td>
<td>(256) 447-9051</td>
<td>(256) 447-2038</td>
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<tr>
<td>Tigard, OR</td>
<td>8005 SW Hunziker Street, Tigard, OR 97223</td>
<td>(503) 670-8815</td>
<td>(503) 597-2758</td>
</tr>
<tr>
<td>Kings Mountain, NC</td>
<td>629 S Battleground Avenue, Kings Mountain, NC 28086</td>
<td>(704) 676-6542</td>
<td>(704) 397-4443</td>
</tr>
<tr>
<td>Wixom, MI</td>
<td>37900 Interchange Drive, Farmington, MI 4833</td>
<td>(248) 937-4400</td>
<td>(248) 397-4443</td>
</tr>
<tr>
<td>Tellico Plains, TN</td>
<td>P.O. Box 9, 116 Industry Road, Tellico Plains, TN 37385</td>
<td>(423) 253-6201</td>
<td>(423) 253-6204</td>
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<tr>
<td>Aurora, IL</td>
<td>1585 Beverly Court, Aurora, IL 60502</td>
<td>(630) 518-9283</td>
<td>(630) 518-9284</td>
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<tr>
<td>Douglas, AZ</td>
<td>402 1st Street, Douglas, AZ 85607</td>
<td>(520) 805-2924</td>
<td>(520) 805-2925</td>
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PART PRODUCT APPROVAL PROCESS (PPAP)

A. Supplier Sample Submission Procedure
All suppliers shall follow the instructions provided in the latest revision of the Production Part Approval Process (PPAP) manual and use the appropriate AIAG forms when applicable. PPAPs are to be submitted following “Level 3” requirements unless otherwise directed.

B. Deviations
Deviation requests must be submitted and incorporated on the part drawing prior to sample submission for production approval by the CVG customer and the Corporate Purchasing Department.

C. Chemical Suppliers
If applicable, chemical suppliers must submit samples and technical information to CVG Product Engineering Department or as specified on purchase order or other document.

D. Laboratory and Test Analysis
A current laboratory accreditation Certificate (per end-customer accreditation policy) must accompany all laboratory analysis reports. The test results must reflect a period not greater than 12 months and indicate laboratory name, address, date, specification number, specification limits, lot number, test results, and a signature of a responsible individual. Lab scope of facility shall be documented. Outside laboratories must be registered to the ISO/IEC 17025:2005 standard.
E. Legislated Requirements
All products supplied to the customer, which are to be installed into a vehicle interior, are subject to FMVSS 302 or other OEM or government/safety regulated requirements. Documentation assuring requirement compliance must be submitted with, or prior to, delivery of each lot of material.

F. Initial Approval (Assembly or Raw Material)
Once the customer PPAP Specialist has evaluated the submission, the customer will notify the supplier of the submission status through the warrant. Production shipments are to be initiated only after the receipt of sample approval, receipt of releases, and receipt of instructions from the customer Corporate Purchasing Department.

G. Initial Approval (Tooling)
All tooling suppliers shall complete and submit a Tool Certification at the time of delivery for each tool cavity. Approval will be given after product is PPAP approved by the user plant/OEM.

H. Annual Re-certification
Test data must be less than one year old. Annual material testing must be performed to validate ongoing conformance to requirements. Material test results are to be kept on file at the supplier location and be available to the customer upon request within the same business day. All records are subject to periodic audit review by customer personnel. The unavailability of the supplier’s data would result in a noncompliance and could result in a plant rejection. If this occurs, the supplier will receive a Problem Solving Report (PSR) and be required to submit a written corrective action plan using this format. NOTE: A complete dimensional/material analysis shall be made available upon request.

I. Material Certification/Warrant Requirements
When required, a certification/warrant document shall contain:
- Supplier name, address, phone number, date
- Customer location address
- Purchase order number
- Quantity shipped
- Shipper number
- Date shipped
- Lot/batch number for traceability
- Product name/number
- Listing of Specification compliant to
- Authorization signature or authorization name if supplied electronically.
- Characteristics controlled (specification values with tolerance & units of measure)
- Actual test methods and results for a particular lot/batch
- Certificates of Analysis (Compliance) – Analysis reports must show the requirement, tolerance range, and the test results.

J. RoHS, IMDS, and REACH Requirements
Many of our customers and OEM’s are increasingly becoming concerned complying with the many world-wide directives involving restricted and hazardous materials. Because of this, CVG is moving also, on a gradual basis, to require our supplier base to likewise seek methods of complying with these directives. All suppliers should develop procedures, as appropriate and as determined by their position in the supply chain, to move towards RoHS, IMDS, or REACH compliance, or any combination thereof. These will gradually become a CVG specific requirement for PPAP submissions.

CONTINUOUS IMPROVEMENT

A. Cost Monitoring
The supplier is expected to cooperate with the customer in an effort to reduce costs and selling price both prior to and during mass production. The supplier must be willing to share suggestions and cost reduction benefits with the customer.
B. VA/VE: Value Analysis/Value Engineering
VA/VE is a systematic problem solving process that involves identifying the functions of a product, determining the cost of those functions, and providing those functions reliably at the lowest overall cost. VA examines current products in an effort to detect and correct value problems and reduce costs.

VE focuses on new products in an effort to identify and prevent value problems before production. This ensures that cost avoidance is designed into the product. CVG expects its suppliers to participate pro-actively in the VA/VE program when called upon.

DOCUMENT AND DATA CONTROL

Engineering Drawing and Specification Control
Assistance in obtaining part drawings and specifications, clarification of specifications, and information on components can be acquired through the customer Corporate Purchasing Department. Information, as it applies to tooling suppliers, can be obtained through the Customer Product Engineering Department.

DOCUMENT / DATA APPROVAL AND ISSUE

A. Engineering Change
The supplier shall have written authorization from the Corporate Purchasing Department or CVG Plant’s Engineering department prior to making any production/engineering changes. Any product shipped containing deviations without having prior change authorization from the customer User Plant(s) will be subject to rejection and/or returned at the suppliers’ expense.

B. Engineering Change Notification
In order to prevent any manufacturing problems should engineering changes be made directly to the supplier at the request of the OEM/end-customer, component suppliers shall immediately contact CVG Supplier Quality and the CVG Plant’s Quality department prior to the first revised production shipment. Prior notice shall include change number, lot number, and date of first shipment. The first approved shipment shall bear a brightly colored printed label with notification of changed material to inform that a change has occurred. Chemical suppliers shall place the brightly colored sticker on the bill of lading as notification of change.

PURCHASING

A. Evaluation of Suppliers and Sub-suppliers
The customer reserves the right to visit the supplier’s and/or sub-supplier’s manufacturing facility to verify the quality of purchased parts and to review quality systems at any time. Such assessment could be to update current supplier information, evaluate potential suppliers, or to review systems due to on-going quality related problems, etc. The customer will use the results of these assessments in business partner determination.

B. Run-at-Rates
The customer reserves the right to participate in, or initiate, run-at-rate assessments of the supplier’s manufacturing capability to meet quoted capacities and quality requirements. These evaluation methods may be requested at the start-up of new programs, during pilot/launch phases, when the product is critical to the customers’ production, etc.

C. Potential Suppliers
Prior to the placement of business, potential suppliers will be required to complete a Supplier Self-Assessment and/or Supplier Profile form for submission to CVG Corporate Purchasing
D. Current Suppliers
The customer recommends that the supplier be prepared to demonstrate documented evidence of procedures, statistical data, current/historical records, and continuous improvement during on-site evaluation, as well as make available all relevant personnel. The assessment results, as well as other performance indicators, determine the supplier rating and if unacceptable, may affect future business in that they may cause the initiation of “Quotation Probation” and/or the resourcing of business.

E. Systems Improvement
If inadequate systems are evident, the supplier will be required to submit a corrective action plan illustrating targeted activities, timing expectations, and responsible persons. This may, if determined adequate, result in an improvement to the supplier’s rating. If requested corrective action is not submitted, the supplier’s rating may be decreased. The supplier may be asked to meet with the Corporate Quality and/or Purchasing Departments at an appropriate location to resolve performance and/or systems concerns. Also, the supplier may submit, at any time without customer request, documentation substantiating system improvements that, upon approval, may increase ratings.

F. Supplier Performance Indicators
All suppliers are monitored as appropriate for:

- Reject Parts Per Million (PPM)
  o CVG requirements of “QUALITY” parts per million is “25 PPM”
- Delivery on time (PPM)
  o CVG requirements of “DELIVERY” parts per million is “0 PPM”
- Corrective Action Response
- Line/operation interruptions
- End-customer assembly plant shutdowns
- Corrective action plans
- Logistical discrepancies (on time delivery)
- Statistical data submissions
- Certification data
- Sample submissions (PPAP)
- Self-assessments
- Repetitive problems
- Warranty Returns
- Pricing / Net Terms

G. Quarterly Performance Report
On a calendar quarterly basis, selected suppliers will receive a Quarterly Performance Report that consists of a compilation of all supplier performance indicators. Noticeable negative changes in supplier performance may initiate contact for corrective action.

H. Verification of Purchased Product
CVG Customers contractually reserve the right to visit the supplier manufacturing site to verify quality of purchased products prior to shipment.

IDENTIFICATION AND TRACEABILITY

Lot Control/Traceability
A lot number shall appear on all labels, and where applicable, on each item shipped, per engineering drawing specifications. Records of lot shipment destination(s) shall be maintained for the life of the program or a minimum of 7 years.
All suppliers shall maintain a lot control and traceability identification system to track all main components, materials, and chemicals to their origin. This system shall also be in effect for any product that has been reworked or repaired. Chemical suppliers shall also maintain proper identification of all pipelines, tankers, control valves, etc.

**PROCESS CONTROL**

**Maintaining Process Control - Capability Studies**
Where applicable preliminary process potential study data shall be gathered in rational subgroups and used to develop preliminary control limits, which demonstrate the stability of the process.

Critical characteristics shall be monitored by acceptable techniques of process control monitoring. When out-of-control conditions are observed, component suppliers shall 100% sort or determine capability to the last point in control. Once correction is implemented, samples shall be taken, and results recorded and plotted on the charts. Chemical suppliers shall concentrate on specification requirements with subsequent attention to Cpk calculations. Chemical suppliers shall conduct statistical studies to evaluate the results of receiving inspection, in-process testing, formula changes, etc. These studies shall be performed on an on-going basis during development and shall include the development of process controls, test methods, and both product and process specifications.

**PROCESS CHANGE**

The supplier shall notify the applicable CVG customer product approval activity, supplier quality, purchasing and material departments of any design, process (including process location), material, or sub-supplier sourcing changes. The supplier shall make notification in writing utilizing the included Engineering Change Request Form (Appendix A). A full PPAP Level 3 (or negotiated PPAP level commensurate with the specific change) will be required unless PPAP is waived in writing by the authorized CVG approval activity.

A. **Customer Notification**
The supplier shall notify the responsible customer product approval activity, supplier quality, purchasing and material departments and of any design and process changes as indicated below.

B. **Process Change Notification Requirements:**
- A new or changed product or tooling (specific part, material, color, plating, etc)
- Correction for any previously submitted part
- Engineering changes to parts or material
- Change in process or process location
- Change in supplier or supplier location (including sub-suppliers)
- Products produced after tooling or supplier location has been inactive for twelve months or more.
- Any change that could affect Fit, Form, Function, Performance, and/or Durability

**VERIFICATION OF JOB SET-UPS**

A. **First/Last Piece Inspection**
When component first piece inspection is used to certify a new set-up, the first piece should be retained throughout the production run and located at the operation whenever possible. It is also recommended that the last piece, once compared to the first piece and accepted, be kept until the next run of that product. Tooling suppliers shall perform ‘all piece’ inspection, and chemical suppliers shall inspect product(s) during appropriate process intervals.
B. Receiving Inspection and Testing
CVG prefers to keep receiving inspection to a minimum. Therefore, on-line usage of components and chemicals may determine acceptance. With the exception of tooling, all shipments received by the customer shall have been inspected and tested to ensure compliance to specifications and shall include the material certification/warrant documentation. Entire lots of material may be rejected at the first sign of a discrepancy in quality conformance. Chemical suppliers of temperature sensitive products are reminded to provide temperature monitoring devices on each shipment as required.

Third party certification to ISO 9001:2008 may be used in lieu of submitting statistical data and material certifications/warrants for component suppliers. However, this does not exempt the supplier from using statistical methods such as a C = 0 sampling plan and maintaining records for review by the customer.

C. Supplier Laboratory Requirements
The supplier shall use a schedule or tracking procedure for tests being performed both internally and externally. When test performance requirements cannot be completed during the shift from which the product was taken, that product shall be held pending successful test completion. When regulatory control is required by specification, records shall be maintained for review to illustrate compliance. Suppliers using outside laboratories must use laboratories that are accredited laboratories that meet the end-customer requirements. Registration to the ISO/IEC 17025:2005 standard is a requirement.

CERTIFICATES OF ANALYSIS (COMPLIANCE)

The supplier shall provide a Certification of Analysis (Compliance) for all product identified by the CVG using plant. Suppliers shall utilize the CVG QF–167 form (See Appendix B).

NONCONFORMING PRODUCT

A. Supplier Tests
Product performance test failure shall be cause for the supplier to quarantine production shipments immediately pending analysis of the process and corrective action. The supplier shall immediately notify each customer location of the failure, shipment suspension, and suspect lot identification. After the root cause of the failure is determined, corrected, and verified and approval by the customer in writing, the supplier may resume shipments.

B. Nonconforming Product Detection and Reporting – Failure Costs
The supplier shall be debited for any/all product failure costs determined to be the responsibility of the supplier, regardless if said failure occurred prior to or after shipment to the end/final customer. Product nonconformance will be reported through the use of a Problem Solving Report (PSR). This form will also be used to inform the supplier of the request to complete a corrective action form for problem resolution outlining containment action and a plan for long term improvement.

C. Nonconforming Product Detection – Notification by Supplier
If shipment of nonconforming or suspected nonconforming product has been detected by the supplier and is in transit or has been delivered to the customer, the supplier shall immediately notify, by phone, the Quality Department at each customer receiving location. Corrective action documentation shall be submitted to the customer(s).

- For all tooling issues, suppliers shall contact customer location(s) as well as the customer Corporate Product Engineering Department. Customer receiving locations may require tooling suppliers to submit a PSR for problem resolution, with corrective action to be submitted to the requesting customer location with a copy submitted to the Customer Product Engineering Department and the customer Corporate Department.
For chemical issues, suppliers shall contact the customer location(s) Materials Department, Corporate Purchasing, and Product Engineering Department.

D. Nonconforming Product Detection – Notification by Customer
If nonconforming product has been detected by CVG, the supplier will be notified via facsimile or email utilizing the PSR. Upon notification, the supplier shall, within 24 hours, review the concern and provide authorization for disposition. Disposition timing may be decreased if specified by the receiving customer due to the individual manufacturing schedule requirements. Disposition possibilities include:

- Supplier personnel sort at customer location
- Customer personnel sort at customer location
- Destroy and dispose of at customer location
- Return product to supplier “freight collect” for credit with replacement product due
- Third party sorting if deemed necessary by the customer due to quality concerns

Costs associated with nonconforming product that causes a line interruption or shutdown at CVG or the end-customer will be the responsibility of the supplier.

REVIEW AND DISPOSITION OF NONCONFORMING PRODUCT

A. Reject Parts Per Million (PPM)
Dividing the number of parts rejected by the number of parts received and multiplying the result by 1,000,000 results in PPM; for example, 5 ÷ 2,500 X 1,000,000 = 2,000 PPM.

Any product which is not within specification (except that product which was received via an approved deviation) will be defined as REJECTED and will be assessed as such against the supplier in PPM reporting. Rejected prototype and experimental product (non-production) shall not be assessed as PPM at any time. When the customer location has insufficient space to take delivery of all product(s) shipped (providing that the quantity shipped equals the quantity ordered), excess product shall not be assessed as rejected.

B. Product Disposition
It is to the supplier’s advantage to visit the customer location for product disposition. This provides the opportunity to view component usage, and allows products to remain in the facility for sorting, reworking, or repairing. Upon sorting, product which is found to be within specification and can be used as is will not be assessed against the supplier PPM. If materials are returned, they will be considered non-conforming (rejected). All non-conforming products impact the supplier on PPM, which is reflected on the Quarterly Performance Report (QPR) and the Monthly Reject Report (MRR).

When the quantity in question is extremely large, the supplier and plant quality personnel may negotiate the best method to disposition the material. In some cases the quantities are so high that sorting within the CVG facility would not be feasible and all products should be returned to the supplier for sorting. It is up to the supplier and plant quality personnel to negotiate the PPM value to be counted against the supplier. This is at the discretion of the plant quality personnel.

To avoid imminent production shutdown, the customer may perform, at the supplier’s expense the necessary sorting inspection, and repairing/reworking operations to maintain production.

C. Containment Plan
Customer personnel may place the supplier into containment if they experience repetitive concerns with a supplier, during the first ten percent of annualized volume produced for a new program, or during pilot/launch phases. Containment will be required when consensus within CVG management determines that current supplier controls are not sufficient to insulate CVG from the receipt of nonconforming parts/material. If this occurs, the supplier will then be notified verbally, followed by a PSR or other written documentation.
CVG personnel at the location experiencing the part/material non-conformance make the determination whether the supplier can effectively correct the situation through the PSR process and/or isolate CVG from the problem. It is the customer’s discretion to determine which and how many characteristics to be inspected until customer confidence has been restored. Standard guidelines for implementation of containment may consider the following:

- Repeat defects
- Duration and severity of the problem
- Incapable processes
- Quality problem at CVG facility, customer or in the field
- Inadequate containment and/or resolution of non-conformances via the PSR process

With the exception of tooling suppliers, suppliers shall employ the “green dot” or other containment plan, which is temporary in nature, until process capabilities and process controls have proven effective. Suppliers shall also initiate an internal containment plan in situations which could affect production, e.g., manpower, materials, products, tools, processes, engineering change, etc. The plan shall provide a method to ensure that all defective and suspect defective products do not reach the customer.

**ALL** costs associated with the supplier being placed on containment, regardless of reason or sourcing arrangement will be at the expense of the supplier.

### D. Containment Level

- **Level I** containment is defined as a redundant inspection process enacted by the supplier’s employees at the supplier’s location in order to isolate CVG from receipt of nonconforming parts/material. This containment effort is to be conducted in a separate area from production with qualified personnel.

- **Level II** containment is the same activity but “person(s) performing the sort” is an impartial third party selected by CVG and paid for by the supplier.

- **Level III** activity In special cases activity may be required to be performed outside the supplier’s facilities at the third party’s location or at a facility deemed appropriate by CVG.

### E. Removal from Containment

In order to be removed from containment, the supplier must provide the customer location with a minimum of three (3) defect-free shipments, both at the supplier and at the customer location, documented proof of a Cpk index higher than 1.33 for related or requested Key Control Item as determined by the customer, an updated control plan addressing the problem, and a completed and approved PSR response with effective permanent corrective action (copied to Corporate Quality).

It is the discretion of the customer whether to place a supplier in containment and to determine what should be in containment, and the length of the containment.

Containment is generally for thirty (30) days or three (3) shipments, but may be reduced or lengthened for an undetermined period of time, depending on performance, customer confidence level, and meeting the criteria for removal which includes the approval by the customer for:

- Sufficient quantities (determined by the receiving customer) shipped with zero defects
- An updated control plan to address the problem
- Statistical data and/or Cpk and Cp data of 1.33 or > for related or requested characteristics
- Approved PSR response to ensure permanent corrective action with no recurrence

The objectives for using a containment plan are to demonstrate a management commitment to proactive containment of all detectable defects, to ensure all processes are capable, and to implement process control. Termination of containment occurs only when the customer notifies the supplier of termination after there is no recurrence of the problem and that the documentation submitted has been accepted.
CORRECTIVE ACTION

A. Problem Solving Report (PSR) Response
The PSR reporting format (see Appendix C) is designed to be a useful tool in identifying and eliminating concerns. Only one defect is to be included on a PSR form. The supplier must include the PSR number on the PSR report. The completed PSR is to be submitted to the appropriate CVG plant, and a copy sent to CVG Corporate Quality. If a PSR is closed verbally through the requesting plant or meetings, the supplier is to then contact Corporate Supplier Quality Assurance.

If a PSR response is required of the supplier by the customer, notification will be provided through use of the PSR or other documented request. In an effort to improve communication and facilitate the PSR review process, simple illustrations depicting the problem product, system or process should be included whenever possible. If the root cause cannot be determined within 48 hours, an updated PSR response report must be provided to the customer location and a copy to the Corporate Quality Department within the next 30 calendar days and every 30-calendar day thereafter until closed. The customer may request an initial PSR response sooner to ensure quality product is being delivered.

B. Unresolved Quality Concerns – Phase Meetings
If a supplier has a large quantity of rejections within a one month period, as indicated on the Monthly PPM Report, or if a supplier’s performance is declining and/or resolution to quality issues is not permanently corrected, the Corporate Quality Department may conduct Phase Meetings for resolution and address required containment level. The Phase Meetings are conducted in three steps in which each step addresses a corrective action plan. If corrective action fails, and performance remains unacceptable, the next step is conducted with an increased level of management. The third phase which will require Level III Containment is the final phase in which the supplier’s business with CVG can be terminated at CVG’s sole discretion (regardless of status of contract), and the business resourced to another supplier(s).

PACKAGING and LABELING

A. Packaging
Refer to Appendix D for specifics.

B. Packaging Approval
Refer to Appendix D for specifics.

C. Labeling
Refer to Appendix D for specifics.

D. Inventory Control Labels
All materials must be shipped in the order in which they were produced, by date (i.e. FIFO - first in, first out).

DELIVERY

A. In-Bound Freight
The supplier shall have a program in effect with their suppliers, which allows at any time, for carrier assignment and tracking of in-bound products. The supplier material control activity shall assure raw material and component availability through documented communication between production, manufacturing, and purchasing activities.

B. Out-Bound Freight
Unless otherwise specified, the customer shall be responsible to coordinate freight carrier and schedule. The supplier is required to use customer-designated carriers; however, suggestions for improvement may be forwarded to the customer Corporate Materials Management Department.

C. Physical Condition
All trailers are expected to be clean and in good useable condition. Any trailer damage shall be reported to the carrier prior to loading of product. Upon receipt of load, the customer shall examine trailer and load, and shall report any package or trailer damage to both the carrier and the supplier. Prior to unloading of the material any damage will be recorded and acknowledged by the vehicle driver.

D. Premium Freight
The supplier shall have a system to monitor all premium freight that shall include documentation describing the necessity and authorization for premium freight. The program shall also include a documented program for reduction/elimination of premium freight that includes corrective action and monthly reporting to the customer on the cause of the premium freight and corrective action taken. The supplier is responsible for all premium freight charges and subsequent charges associated with product that is delayed, due to supplier logistical, quality or scheduling problems.

E. Logistical Concerns
Logistic concerns will be reported on the PSR or other appropriate forms and will be assessed against the supplier. Logistical concerns will be assessed against the supplier on the Quarterly Performance Report.

In concurrence with the above report, suppliers may receive a report detailing a past due condition. Receipt of this report shall initiate immediate reconciliation of shipment discrepancies through contact with the Materials Manager of the issuing plant.

F. Customer and Production Schedules
The supplier must generate a production schedule that ensures all customer requirements are met. The supplier shall maintain documentation that shows the correlation between weekly customer requirements and the production schedule, or as specified by the Just-In-Time (J.I.T.) schedule. Suppliers may receive a report detailing a product past due condition, receipt of which shall initiate immediate reconciliation through contact with the Materials Manager of the issuing CVG facility.

G. Non-Delivery, Delayed Deliveries or Short Shipments
If non-delivery, delayed deliveries or short shipments are anticipated, ALL suppliers shall immediately notify the customer Materials Management Department of the receiving location. Tooling suppliers shall also contact the customer Program Manager or Applications Engineer.

Delays, short shipments, or quality rejections may cause line or operation interruption at the customer, and in severe cases, may result in OEM assembly plant shutdown. In the event of concerns that interrupt production, the following shall occur:

- The customer shall immediately notify the Material Manager of the supplier.
- A PSR will be submitted by the customer to the supplier.
- A PSR response report may be requested.
- The supplier must complete the PSR response with permanent corrective action and send the original to the customer and a copy to the Corporate Quality Department.

H. Interruption/Shutdown
If a customer location experiences an interruption/shutdown caused by the supplier due to a quality issue, lack of raw materials, etc., the affected customer will contact the supplier verbally. A PSR or other written document will be issued following the contact. An interruption is defined as individual tools/molds/jobs that had to be turned off or skipped. A shutdown is when the entire line is shutdown. This could occur at either or both CVG or the end-customer. Upon verbal notification of the interruption/shutdown, the supplier shall determine appropriate action
and advise the customer location of future actions. The supplier also assumes all subsequent premium freight charges incurred by the customer due to the interruption/shutdown.

The supplier may be requested to submit the PSR Response via e-mail, voice, or in writing. All interruption/shutdown information is maintained and each incidence is assessed against the supplier in the Quarterly Performance Report (QPR). This report determines supplier quoting status for new CVG business.

CONTROL OF QUALITY RECORDS

A. Chemical Suppliers - Record Retention
All chemical suppliers shall retain samples of both incoming raw materials as well as finished product for a minimum time equal to the shelf life of the lot, or six months after the production of the lot. Where actual samples are not possible, e.g., unstable or volatile chemicals, the supplier must maintain records of analysis.

B. Control Characteristics
Characteristics should be mutually agreed upon by the customer and supplier and chosen on the basis of product function, design intent, fit, manufacturing process or other factors that may contribute to an out-of-control condition. CVG Divisions supports the use/benefits of statistical techniques (SPC/SQC).

C. Unidentified Key Product/Control Characteristics (KPC/KCC’s)
If the customer has not identified key product/control characteristics, the supplier shall choose process and/or product control characteristics that pertain to product manufacturing. It is recommended that product application be discussed with the receiving customer location(s) Quality Department representative and/or Technology Group for determination of key product/control characteristics affecting manufacturing processes.

CONTROL CHARACTERISTICS

A. Key Product/Control Characteristics (KPC/KCC’s)
When key product/control characteristic designation is identified on drawings, specifications, supply agreements, or purchase orders provided by the customer, the supplier is required to submit statistical data on that characteristic to the attention of the Quality Manager at each receiving customer location.

B. Component Supplier Statistical Data Submission
Component suppliers shall submit summaries of average Cp and Cpk indices for the combined calendar quarter to each customer location quarterly (to arrive prior to the 7th of the following month), or on a schedule mutually agreed upon by the Quality Manager of each customer location and the supplier. Additional or more frequent, statistical information may be requested for assistance during problem solving.

The supplier must employ a continuous improvement program aimed at maintaining a minimum Cpk of 1.33 with expectations to exceed this minimum and realize a Cpk of 1.67. Out-of-Control conditions and processes with less than 1.33 capability must include corrective action (8D format may be used). If corrective action is not included, compliance will be assessed on the Quarterly Performance Report (QPR).

It is advised that suppliers submit the data via fax or email and verify receipt of statistical data to prevent adverse effects on the QPR. It is the supplier’s responsibility to ensure that the data reached the appropriate personnel to prevent non-compliance.

C. Cp and Cpk Indices
The Cp index indicates whether the process variation is acceptable, that is, if the process were centered correctly, could it produce all products within specification. It does not measure whether or not the process is centered properly. The Cp index is obtained by comparing the size of the specification width (upper specification limit minus lower specification limit) with the size of the total process spread (6σ).

The Cpk index measures the effect of both the “centered-ness” and variation at the same time. If the process distribution is well within specification on the worst-case side, it is sure to be acceptable.
Process capability is valid only if the process is in a state of statistical control. If the process is not in control, it is unpredictable and it is not possible to reliably estimate future performance.

D. Chemical Supplier Statistical Data Submission
Suppliers providing Resin and Catalyst must monitor control characteristics as listed below through SPC/SQC methods. All other chemical suppliers must submit SPC/SQA data on existing COA data. This data shall be submitted for the combined calendar quarter to each customer location quarterly (to arrive prior to the 7th of the following month), or on a schedule mutually agreed upon by the Quality Manager of each customer location and the supplier. Additional or more frequent, statistical information may be requested for assistance during problem solving.

The supplier must employ a continuous improvement program aimed at achieving a minimum Cpk of 2.24 (Ppk of 1.67). Out-of-Control conditions and processes with less than 1.67 capability must include corrective action (the PSR format may be used). If corrective action is not included, it could adversely affect the assessment on the Quarterly Performance Report (QPR). It is advised, that suppliers submit the data via fax or email and verify receipt of statistical data. A copy of the data is to be submitted to the Chemical Applications Department. It is the supplier's responsibility to ensure that the data reached the appropriate personnel.

ENVIRONMENTAL GUIDELINES
Commercial Vehicle Group strives to conduct all of it operations in an environmentally sound manner whereby regulatory requirements of global regions, country, states and provinces, and local requirements become the minimum standards of the business. Suppliers to Commercial Vehicle Group (CVG) of production materials, equipment, services and consumable goods are expected to follow these same guidelines as their business practices. It is desirable for all suppliers to have an effective management system for environmental improvements.

Areas of environmental concerns for the performance of suppliers’ products and services are:
- Evidence that suppliers comply with regulatory requirements of global regions, country, states, provinces, and markets are met (RoHS, IMDS, and/or REACH).
- Non Use of chemicals or material ingredients in Volvo’s black or grey list.

CORPORATE SOCIAL RESPONSIBILITY REQUIREMENTS FOR SUPPLIERS
CVG is committed to ensuring the highest standards of social responsibility throughout our supply chain. The companies we do business with shall provide safe working conditions, treat employees with dignity and respect, and use environmentally responsible manufacturing processes wherever CVG products are made.

WARRANTY GUIDELINES
Supplier warrants that all articles, materials and work supplied conform to the requirements, specifications, drawings, samples or other descriptions furnished or adopted by Commercial Vehicle Group (CVG) that they are free from all defects in manufacture or design and are of merchantable quality and fit the intended purpose. This warranty coincides with basic and component warranty with OEM and Fleet customers as well as extended warranty and will begin with the date that the vehicle is placed into service (Delivered to the User date).
Appendix A

Engineering Change Request (Process Change Request) form
## Appendix B

Certificate of Analysis form
## Certificate of Analysis

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<tr>
<th>Supplier Information</th>
<th>Manufacturing Location</th>
<th>Date:</th>
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<tr>
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<td>Name:</td>
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<td>Street Address:</td>
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<th>Test</th>
<th>Method</th>
<th>Customer Specification (if applicable)</th>
<th>Supplier Specification</th>
<th>Tolerance</th>
<th>Unit of Measure</th>
<th>Testing Results</th>
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<th>Fail</th>
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Example: | Example: | Example: | Example: | Example: |
---|---|---|---|---|
Color Readings: | CIE L*a*b* | Compared to Master: DE 0.5 | Max DE 0.5 | DL: -0.20; Da: -0.11; Db: 0.42; DE: 0.48 |
### Verification Method and evidence evaluated:

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<th>Corrective Action Checklist Complete?</th>
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<td>Closure Approval: (Name &amp; Title)</td>
<td>Date:</td>
<td>YES</td>
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<tr>
<td>Presented in Mgmt Review</td>
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**NOTE:** INITIAL RESPONSE DUE WITHIN 24 HOURS OF INITIATION. FINAL RESPONSE DUE WITH ROOT CAUSE EXPLANATION DUE WITHIN 15 CALENDAR DAYS.
Direct Cause Analysis: (Fishbone)

1) Indicate possible direct causes: x2) Circle most likely direct cause 2) Circle most likely direct causes.

- Man
- Machine
- Environment

- Method
- Material
- Measurement

Test Each
(✓) Direct Cause of the Problem
(?) Possible Direct Cause
(CROSS OUT) Not a cause of the problem

TEST POSSIBLE DIRECT CAUSES FROM FISHBONE

Intermediate Action Plans (not containment)

<table>
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<tr>
<th>Who</th>
<th>Target Complete</th>
<th>Actual Complete</th>
<th>Status</th>
</tr>
</thead>
</table>

Key for Status:
- Not started
- Identified
- Implemented
- Feedback
- Closed
CORRECTIVE ACTION REQUEST (CAR)

Step 1: Evaluate associated Process(es), Procedure(s), Work Instruction(s), and/or Form(s)
Step 2: Determine root cause by conducting 5-why method (other methods may be used, e.g., Fishbone)
Step 3: Determine Permanent Actions / Long Term Countermeasure corrective action(s) (action to eliminate the cause of nonconformity in order to prevent recurrence)
Step 4: Correcting the finding (how are you going to correct the immediate finding)
Step 5: Determine the corrective action impact (apply to other similar processes and products the corrective action)

PROCESS / PROCEDURE / WORK INSTRUCTION REVIEW:
Which Process(es)/Procedure(s) does this nonconformity occur?
Were these documents adequate / suitable?
Root Cause (5 Why Required)
Which Work Instruction(s) / Form(s) does this nonconformity occur?
Were these documents adequate?
Root Cause Analysis (5 Why): In the first WHY write down the Direct Causes.
(If you found more than one Possible or Direct Cause, please utilize additional sheets for each Direct Cause)

Root Cause: ____________________________________________________________________________________________

System and Process Failure Root Cause

CORRECTIVE ACTION FOR ROOT CAUSE LISTED ABOVE

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<th>Who</th>
<th>Target Complete</th>
<th>Actual Complete</th>
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Key for Status:  
- Not started  
- Identified  
- Implemented  
- Feedback  
- Closed
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<th>Why did the planning process not predict the defect?</th>
<th>5 Whys</th>
<th>Corrective Action</th>
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<td>Planning process - informational content in FMEAs and CPs</td>
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<td>Why did the manufacturing process not prevent the defect?</td>
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<td>Prevent</td>
<td>M2</td>
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<td>Manufacturing process - standardized work and error proofing</td>
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<td>Why did the quality process not protect the customer from the defect?</td>
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<td>Protect</td>
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<td>What are the key findings based on this quality issue and the above 5 Why analysis?</td>
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# Appendix D
Supplier Packaging and Labeling Guidelines & Specifications

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3.4.2.2 Master Load Label

3.4.2.3 Mixed Load Label

3.4.2.4 Internal Container Label

3.4.2.5 Returnable Containers

3.4.2.6 Packing Slip

ATTACHMENT 1 – PACKAGING AUTHORIZATION FLOW CHART

ATTACHMENT 2 – EXPENDABLE PACKAGING DATA SHEET

ATTACHMENT 3 – PACKAGING - SHIPPING TRIAL DOCUMENT

ATTACHMENT 4 – PRIMARY CONTAINER LABEL

ATTACHMENT 5 – MASTER LOAD LABEL

ATTACHMENT 6 – MIXED LOAD LABEL

ATTACHMENT 7 – INTERNAL CONTAINER LABEL

ATTACHMENT 8 – DATA IDENTIFIERS LISTING

ATTACHMENT 9 – LABELING FORMAT AND TERMINOLOGY

ATTACHMENT 10 – FONT SIZE TERMINOLOGY

ATTACHMENT 11 – OCEANIC CONTAINER SPECIFICATIONS

ATTACHMENT 12 – IMPORT CURTAIN PACKAGING SPECIFICATION

ATTACHMENT 13 – “387” BUNK PACKAGING SPECIFICATION
1.0 INTRODUCTION

1.1 Preface

The labeling requirements described herein will take effect upon receipt of this document. The packaging requirements described herein, for new suppliers or product, will take effect upon receipt of this document. For current suppliers and current product, suppliers are “grandfathered” and will supply current product in their current form. At such time as the CVG Packaging Engineer determines, current methods of packaging will be reviewed with the supplier in accordance with this document.

1.2 Purpose

The purpose of this specification is to provide requirements, guidelines, and clarity to the packaging and labeling needs of CVG Global Truck Division suppliers.

1.3 Scope

This specification applies to all suppliers (both external and internal) to a CVG plant within North America.

1.4 Delivery Performance

A supplier’s conformance (or non-conformance) to this specification has a direct result on that supplier’s Delivery Performance PPM rating.

1.5 General Statements

a. This document applies to all products shipped to a North American CVG plant.
b. In this document the word SHALL refers to a required action, and the word SHOULD refers to a recommended action.
c. Compliance is mandatory, unless on a case-by-case basis an exception is warranted.

1.6 Applicable References

a. Parts Identification and Tracking Application Standard, AIAG B-4, Version 3, dated 2/1/03
b. Trading Partner Labels Implementation Guideline, AIAG B-10, Version 3, dated 6/1/04
d. Expendable Packaging Data Sheet, CVG QF-152, dated 8/29/06
e. Packaging Material RFQ, CVG QF-154, dated 8/31/06
f. Packaging - Shipping Trial Document, CVG QF-153, dated 8/31/06
g. Data Identifier and Application Identifier Standard, ANSI MH10.8.2-2004
i. Solid Waste Management Packaging Material Guideline, AIAG RC-7, Version 1, dated 12/1/92

For additional information and publications on AIAG standards, contact the Automotive Industry Action Group, 26200 Lahser Road, Suite 200, Southfield, MI 48003-7100, USA, Phone (248) 358-3570, or their website www.aiag.org

For additional information and publications on ANSI standards, contact the American National Standard Institute at (212) 642-4900, or their website www.ansi.org

For additional information on SPI symbology, contact the Society of Plastics Industry, 1667 K Street NW, Suite 1000, Washington, DC 20006, USA, Phone (202) 974-5200, or their website www.plasticsindustry.org
2.0 PACKAGING SPECIFIC REQUIREMENTS

2.1 General Requirements

a. Realizing that it may be unavoidable due to low volumes and/or shipping/handling expense, the mixing of part numbers in a container or pallet is discouraged, and is not the preferred manner of shipping, or receiving, product.

b. The supplier is responsible for the packaging and labeling of their product to ensure proper condition and quality upon delivery to a CVG plant. Parts must arrive at a CVG plant on-time, without damage, no rust or corrosion, and no contamination. Packaging shall be agreed upon prior to the first shipment of material (current suppliers of current material are “grandfathered” to the extent that they minimally meet the intent of this document).

c. Packaging is to be considered part of the supplier’s manufacturing/distribution process and shall be included in their Process Flow Diagram, Process FMEA, and Control Plan for PPAP/Corrective Action/Continuous Improvement procedures.

d. The supplier shall be responsible for completion and submission of forms QF-152 Expendable Packaging Data Sheet, and QF-153 Packaging - Shipping Trial Document to the appropriate Commodity Manager / Packaging Engineer for CVG approval, when applicable (Contact – Commercial Vehicle Group, ATTN: CVG Packaging Engineer, 7800 Walton Parkway, New Albany, OH 43054, Phone 614-289-0234, Fax 614-289-5361).

e. Returnable containers are the preferred manner of packaging and transport when it is feasible and cost effective. When returnable containers are used, the supplier shall be responsible for its cleanliness, and for storage at their site. In addition, if returnable containers are used, a back-up method of packaging shall be documented, for those times when insufficient quantities of returnable containers are available (approval for the back-up packaging must be coordinated with the CVG Packaging Engineer – see step 2.1.d and Attachment 1).

f. On occasion, testing may be necessary to properly assess the ability of the packaging design to fulfill the requirements of this specification. If testing is needed, or if sample shipments are necessary to validate the packaging design, contact the appropriate CVG Commodity Manager / Packaging Engineer for guidance.

g. Supplier initiated packaging or cost improvements are encouraged, but must first be reviewed and approved by CVG Packaging/Quality Engineering (see step 2.1.d and Attachment 1).

2.2 Trans-Oceanic Shipping Requirements

For any trans-oceanic shipping, please contact the CVG Logistics Coordinator for up-to-date information on carrier and schedules at (614) 289-5173. Also see Attachment 11 for container sizes and details. In addition to the requirements noted in paragraph 2.1, suppliers will need to ensure that all products are protected from moisture/water damage when shipping product trans-oceanic.

Note: For specific information concerning packaging of import Curtains, see Attachment 12. For specific information concerning packaging of “387” Bunks, see Attachment 13.


2.3 Specific Packaging Requirements

2.3.1 Palletization Requirements

<table>
<thead>
<tr>
<th>Face Depth</th>
<th>40” (1016mm)</th>
<th>40” (1016mm)</th>
</tr>
</thead>
</table>

CVG Standard 48” (1150mm) 40” (1016mm) 40” (1016mm)

AIAG Standard 48” (1150mm) 45” (1220mm) 51” (1295mm)

AIAG Standard 32” (760mm) 30” (820mm) 40” (1016mm)

AIAG Standard 36” (914mm) 30” (820mm) 40” (1016mm)

a. The CVG standard pallet size is 48” x 40”. If a different sized pallet is required, the pallet length should be sized to accommodate the part length while maintaining the 48” pallet dimension for proper trailer utilization.
b. Pallets should be stamped on at least one side with the pallets overall footprint dimension.
c. All pallets must be able to support a 2800 lb. load while triple stacked.
d. The use of corrugated, salvage, and other pallet alternatives are prohibited unless investigated in cooperation with CVG Packaging/Quality Engineering.
e. Unitization and palletization is required for all parts and should be designed to stabilize and complement the primary containers to prevent movement throughout the handling cycle.
f. The unit load must be modular to the pallet and remain stable for material handling and storage after initial part access and removal.
g. All containers must be properly palletized and secured to the pallet.
h. Palletized cartons should be uniform in size to maintain load stability.
i. Maximum overall height per unit load is 40”.
j. Containers must be palletized in individual level layers (tiers) on the pallet. No “pyramid” unit loads. If material release quantities do not permit shipment of individual level layers of containers, investigate and explore alternative methods of containerization and/or contact CVG Packaging/Quality Engineering for assistance.
k. Palletize by like part number, if at all possible. **The default policy of CVG is to not mix loads, and to not load right and left hand parts on the same pallet.**
l. Unique requirements or concerns may exist and be required by individual plants.
m. No material is to extend beyond the pallet edge, nor be more than 2” less than pallet footprint on any side.
n. For wood pallets – they shall conform to National Wood Pallet Container Association Voluntary Standard for Wood Pallets (NWPCA), be double face, non-reversible, and shall allow 4-way entry.
o. Wood pallets imported into the U.S., shall be free of bark and pests according to U.S. regulations (reference regulations at the government website [www.aphis.usda.gov/ppq/swp](http://www.aphis.usda.gov/ppq/swp)).

2.3.2 Securing Material

The preferred method of securing material is either plastic, heat sealed strapping of green polyester, or stretch film. Plastic strapping and stretch film should secure the entire palletized load including the pallet. The use of unitizing adhesives for individual cartons is encouraged.

When a unit load is stretch wrapped, a Master Label or a Mixed Load Label shall be adhered to the outside of the stretch film, visible to operators and readable for barcode scanning. This label is required for all stretched wrapped unit loads of single or multiple packs. This label may be removed with the stretch film making individual container labeling necessary as described later in the specification.

2.3.3 Weight Limitations

a. Maximum shipping weight: 2800 lbs., triple stacked pallets
b. Maximum primary container weight: 40 lbs.
2.3.4 Corner Boards

As required to protect shipment.

2.3.5 Corrugated Paper

a. Corrugated paper fiber board shall exhibit adequate strength to withstand transportation, support multiple stacking of unit pallet loads, and be of sufficient burst strength to protect the product within.

b. If an exception to stacking is required, the packaging shall be conspicuously labeled as such, i.e. “DO NOT STACK”, “STACK NO MORE THAN 2 HIGH”, etc.

2.3.6 Plastic Bags

When plastic bags are used for packaging, they should be utilized inside the primary container, totes, or bulk containers for adequate protection. The containers and plastic bags shall be labeled in accordance with this document’s labeling requirements.

2.3.7 Containers

The primary container will carry the part from shipping to assembly where it is presented to the operator.

2.3.7.1 Requirements:

a. The compression strength of the container(s) must support contents triple stacked up to 100” in height for maximum trailer density and storage. No “Top Load Only” containers.

b. No more than one part number per container. There may be unusual or special circumstances where this will need to be addressed. Either contact the CVG Packaging/Quality Engineer, or contact the CVG plant for an exception.

c. Container(s) must be completely filled and may require redesign to eliminate void space, part shifting, and container crushing.

d. Small, manually-handled totes must not exceed 40 lbs., and should contain at least 10 parts.

e. No individual or aftermarket packaging is permitted for production parts.

f. The unsupported bottom of the manually-handled container must hold the weight of its contents.

g. Large, mechanically-handled bulk containers should be used for large, heavy parts with typically high release quantities. The container must be designed with adequate compression strength to prevent sidewall bulging and incorporate a “break-away” feature (see AIAG RC-7) with minimal staple usage if it will be adhered to the pallet unitization.

h. Unit loads must be properly loaded, blocked, and braced for shipment.

i. Void space must be filled to prevent load shifting in transit.

2.3.7.2 Size:

a. Apply the finished piece part weight (lbs.) and the estimated shipping/release quantity to a matrix to determine classification into manually-handled tote or a mechanically-handled bulk container. The part characteristics (size, volume, handling, etc.) are what dictate the container selection.

b. Acceptable primary container sizes will be modular to the standard 48” x 40” pallet footprint. If it is necessary to deviate from the given primary container sizes, please contact the CVG Packaging/Quality Engineer for approval.
2.3.7.3 Sealing:

Acceptable methods of sealing manually-handled totes are strippable reinforced tape or spot gluing. Alternative methods may only be acceptable with prior approval from the receiving plant locations.

2.3.8 Internal Part protection

Parts must be secured and protected in the primary container and be free of damage upon delivery. Internal dunnage must not restrict part presentation to the operator.

a. Whenever possible, paper-based dunnage shall be used.
b. For part surfaces requiring plastic packaging materials, the material must be designed for recyclability and ease of segregation. All plastic packaging must be identified by resin type according to the symbology established by the Society of Plastics Industry (SPI).
c. No foreign materials may be adhered to corrugated board or wood.

2.3.9 Packaging Authorization Flow Chart

See Attachment 1

2.3.10 Expendable Packaging Data Sheet

See Attachment 2

2.3.11 Packaging-Shipping Trial Document

See Attachment 3

3.0 LABELING REQUIREMENTS

3.1 Types of Labels

There will be five different label types required of CVG suppliers, each depending on how the product is packaged. The examples described and shown are the preferred formats, however, the data fields are mandatory. Actual labels may vary consistent with the supplier’s printing capabilities.

3.1.1 Primary Container Label

This label is used to identify the primary container, whether it is a carton, tote, etc. containing the same part number. See Attachment 4 for an example.

3.1.2 Master Load Label

This label is to be used for all shipments of material, regardless of quantity of containers. This label functions to summarize the total quantity of a single part number or lot number of material. If more than one part number or lot number is included in the container, pallet, skid, etc., a Master Label for each part number or lot number shall be used. See Attachment 5 for an example.

3.1.3 Mixed Load Label

This label is used for containers, pallets, skids, etc. holding more than one single primary container of different part numbers. See Attachment 6 for an example.
3.1.4 **Internal Container Label**

This label is used for internal containers (those containers such as bags, kits, etc.) that are shipped inside the primary container. This label is in addition to labels for single or multiple containers. See Attachment 7 for an example.

3.1.5 **Primary Metal Suppliers Label**

Primary metal suppliers/bulk suppliers are exempt from paragraphs 3.1.1 thru 3.1.4. However, the supplier shall contact the individual receiving CVG plant(s) to agree on an acceptable labeling format.

3.1.6 **Label Application and Usage Summary Table**

<table>
<thead>
<tr>
<th>Packaging Used</th>
<th>Primary Container Label</th>
<th>Master Load Label</th>
<th>Mixed Load Label</th>
<th>Internal Container Label</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary Container Single P/N</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Primary Container Multiple Lots/POs</td>
<td>X</td>
<td>X (each Lot or PO)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Multiple Containers Single P/N or Single Pallet</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Multiple Containers Multiple P/Ns or Single Pallet</td>
<td>X</td>
<td>X (each P/N)</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Internal Container</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

3.2 **Data Identifiers**

See Attachment 8 for commonly used Data Identifiers anticipated to be used for CVG labeling requirements.

3.3 **General Requirements**

3.3.1 **Label Formatting and Terminology**

See Attachment 9 for clarification.

3.3.2 **Label Size**

Label size can be either 4.0” (102mm) high by 6.0” (152mm) wide (preferred), or 4.0” (102mm) high by 6.5” (165mm) wide.

3.3.3 **Label Color**

Label color shall be white with bold, black printing.
Note: Exceptions to this requirement will be determined by the individual plants based on their special/temporary needs, with examples being: Major engineering change is implemented; Product is prototype material; Early Production Containment; Clean point demarcation; Left/Right handed parts segregation; etc. This exception will be communicated to the supplier at the CVG plant level.

3.3.4 Adhesives

Adhesives can be either pressure sensitive or dry gummed so long as label adherence is assured and is wrinkle-free. For returnable containers, the adherence shall not leave a residue when label is removed, and label must be easily removed without tearing.

3.3.5 Label Font

Bar Code symbols shall be represented by Human Readable Interpretation characters (HRI), not to include Data Identifiers, Start and Stop characters, and shall be printed left justified approximately 1.0-1.5” (25-38mm) from the left edge of the Block or Sub-block. The preferred font is Arial Sans Serif, all upper case. Display human readable zeroes (0) with a diagonal slash to differentiate between a number zero and the letter “O”. See Attachment 10 for a summary of font size specifics.

3.3.6 Symbology

All Bar Codes shall be Code 39 symbology. A leading space character shall not be used. The four characters %, /, $, + shall not be used. Recommended “X” Dimension is .015” (.38mm), but shall be between 0.010-0.017” (0.25-0.43mm). Bar Code symbol shall have a leading and a trailing quiet zone of .25” / 6.3mm (or a minimum of 10 times the “X” dimension, recommended).

Note: Based on plant specific needs and requirements, there may be instances when some labels will need to incorporate 2-D labeling symbology (i.e. PDF417 symbology). This should be addressed with the CVG plant directly.

3.3.7 Print Quality

The printing media shall be of proper carbon content to ensure passing ANSI X3.182 parameters. The following minimums shall also be met:
- Minimum print quality grade 2.0 (c)
- Measure aperture 0.005” (.127mm)
- Inspection wavelength 660nm ±10nm

3.4 Label Quantity and Placement

3.4.1 Label Protection

Label protection is the responsibility of the supplier. Placement shall be such that the label(s) are not compromised in any way to any CVG plant. Protection against moisture, weather, etc. should be considered. When choosing protection for the labels, the supplier shall consider the effects such protection may have on the reflectivity and contrast characteristics, so not to interfere with the ability to scan the labels with contact or non-contact scanners.

3.4.2 Label Location

3.4.2.1 Primary Container Labels

Two labels shall be used for each primary container. The labels shall be on adjacent sides of the container. Labels shall not wraparound the corners of the container, be as close to the upper edge of the container as possible, but should be a minimum of 1.25” from the edges of the container.
Note: For material that is rolled (e.g., vinyl), a label will be placed in each end of the core for traceability and identification.

3.4.2.2 Master Load Label

Two labels shall be used for each container. The labels shall be on opposite sides of the container. Labels shall not wraparound the corners of the container. The labels shall be placed on the upper half of the container, centered, no closer than 1.25” from any edge, and no higher than 60” from bottom of pallet to bottom edge of label. If more than one Master label is needed, they will be placed vertically from one another.

3.4.2.3 Mixed Load Label

Two labels shall be used for each container. The labels shall be on opposite sides of the container. Labels shall not wraparound the corners of the container. The labels shall be placed on the upper half of the container, centered, no closer than 1.25” from any edge, and no higher than 60” from bottom of pallet to bottom edge of label. If used in conjunction with a Master label, it will be placed vertically of the Master label, above any Master label.

3.4.2.4 Internal Container Label

One label shall be used for each sub-pack of a container. As best as possible, labels should not wraparound corners, and should be away from any edge.

3.4.2.5 Returnable Containers

In cases where the returnable containers have label holders on opposite sides the labels may be placed in these holders. Labels should be no closer than 1.25” from any edge. Labels shall not wraparound the corners. Label may be placed on adjacent sides if it is more prudent. Any and all labels from returnable containers shall be removed before reuse.

Note: Returnable containers shall also require identification that contains the supplier’s name and return location on the outside of each returnable packaging item. Failure to properly identify returnable packaging will result in delays in returning the packaging/dunnage.

3.4.2.6 Packing Slip

The packing slip contains important information necessary for proper receipt and financial processing. The following items shall be provided:

- Supplier Code number
- P.O. number
- Ship to address
- Bill to address
- Ship date
- CVG part number(s)
- Total quantity (per part number)
- Packing slip number

Every shipment shall have a Packing slip. The design and format of the Packing slip is at the discretion of the supplier, provided it meets the above requirements.
ATTACHMENT 1 – Packaging Authorization Flow Chart

Supplier reviews CVG Supplier Packaging and Labeling Specification

Is supplier to use current packaging or new packaging?

New Packaging

Supplied contacts CVG Packaging Engineer providing details and cost

Current Packaging

Supplier submits Expendable Packaging Data Sheet

CVG Packaging Engineer evaluates supplier’s submission

Accepted?

Yes

Supplier notified of packaging authorization

No

Trial shipment required?

Yes

No

CVG and supplier completes the Packaging-Shipping Trial Document

Yes

CVG and supplier develop plan for trial shipment

No

Success?
### Expendable Packaging Data Sheet

**Supplier:**

**Supplier Contact Info:**

**CVG Part Number:**

This Data sheet is for:  
- [ ] Current Packaging  
- [ ] Proposed Packaging  
- [ ] Effective From:

### Packaging Materials with other related costs

**Basic Information:**
- # Parts per Container: 
- # Containers per pallet: 
- # Pallets per Container (20'/40'): 
- # Total Parts Shipped: 

**Primary Container Information:**
- Length: ___ in.  
- Width: ___ in.  
- Height: ___ in.  
- Tare Weight: ___ lbs.
- Wall Construction:  
- Edge Crush Test (ECT):  
- Burst Strength:  
- Container Style:  
- Cost of Container: 
- # Parts per Container: 

**Dunnage Information:**

Describe internal part protection with type of material/style in the primary container.

**Pallet Information:**
- Heat Treated: [ ]  
- Non Heat Treated: [ ]  
- Length: ___ ft.  
- Width: ___ ft.  
- Height: ___ in.  
- Tare Weight: ___ lbs.  
- Max Load: ___ lbs.  
- Pallet Cost: 
- # Containers per pallet: 
- # Tiers per Pallet: 
- # Parts per Container: 

**Unitization Information:**

Method of Securing container to pallet (stretch wrap, banding etc)

**Label Information:**

Follow AIAG Publication B-10 and also the CVG Supplier Packaging and Labeling Guidelines & Specifications.

**Total Packaging Cost per part:**

\[
\text{(B+C+D+E+F)} = \text{\textbf{\$0.0000}}\]  

---

**Note:** All of the above fields need to be completed. Place N/A if not applicable. This sheet is to be used only for Expendable packaging. Place digitized photos on page two which will aid in clarification.

---

**CVG / Global Truck Division**

Corporate Purchasing Group/Packaging Engineering

7800 Walton Parkway

New Albany, OH 43054

Fax Number: (614) 289-5361

---

**Printed Copies Uncontrolled**
### ATTACHMENT 3 – Packaging - Shipping Trial Document

<table>
<thead>
<tr>
<th>Commercial Vehicle Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global Truck Division</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

**Packaging - Shipping Trial Document**

#### Current Box Specifications

<table>
<thead>
<tr>
<th>ECT</th>
<th>Bursting Strength</th>
<th>Box Construction</th>
<th>Single/Double/Triple Wall</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tr>
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</table>

<table>
<thead>
<tr>
<th>Box Style</th>
<th>Size Limit</th>
<th>Gross Wt</th>
</tr>
</thead>
<tbody>
<tr>
<td>FOL/FTD</td>
<td>Inches</td>
<td>Lbs</td>
</tr>
<tr>
<td>RSC/HSC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tray</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
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<td></td>
</tr>
</tbody>
</table>

#### Proposed Box Specifications

<table>
<thead>
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<th>ECT</th>
<th>Bursting Strength</th>
<th>Box Construction</th>
<th>Single/Double/Triple Wall</th>
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<tr>
<th>Box Style</th>
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<th>Gross Wt</th>
</tr>
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<tr>
<td>FOL/FTD</td>
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<td></td>
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<tr>
<td>RSC/HSC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tray</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Results

- **Check One Below**
  - Sample package with no issues
  - Sample package with minimal issues
  - Sample package with significant issues
  - Sample package will not work

- **Comment below on What needs to be changed OR Failed**

- **Sign Off**
  - CVG-Liaison

---

**Note:** Attach pictures of the packaging trial box on page two upon receipt. Use "Hold Ticket" on CVG-002 worksheet for identification of the trial box.

When using this form, the form QF-152 shall also need to be completed and submitted.
ATTACHMENT 4 – Primary Container Label

**PRIMARY CONTAINER LABEL**

- All Bar Codes shall be Code 39 Symbology
- All Bar Codes shall be 0.5 inches (12.7mm) in height
- All Bar Codes shall use a narrow element size as defined in AIAG B-10 Revision 3
- Unless otherwise specified, human readable interpretation of all Bar Codes should be 20 point font size, all upper case.

**Recipient's Address**

- Block Title: TO
- Data: Customer’s address
- Text Height: 6 LPB
- Max. Chars: 3 lines of text, up to 22 Chars on a line

**Sender's Address**

- Block Title: FROM
- Data: Supplier’s address
- Text Height: 6 LPB
- Max. Chars: 3 lines of text, up to 22 Chars on a line

**Part Number of Contents**

- Block Title: PART # CUST (P)
- Data: Customer assigned Part Number (CVG Assigned)
- Maximum Length: 18 Chars + 1 DI Char (P)

**Description of Part**

- Block Title: DESCRIPTION
- Data: Part description
- Text Height: 5 LPB
- Max. Chars: 2 lines of text, up to 36 chars on a line

**Supplier Identification**

- Block Title: VENDOR ID CUST ASGN (V)
- Data: Customer assigned ID
- Maximum Length: 6 Chars + 1 DI Char (V)

**Quantity and Unit of Measure**

- Block Title: QTY + U/M (7Q)
- Data: Quantity of material followed by two-character unit of measure code
- Maximum Length: 17 Chars + 2 DI Char (7Q)

**Manufactured Date of Material**

- Block Title: MANUFACTURING DATE
- Data: Date product produced
- Text Height: 3 LPB
- Max. Chars: 8 Chars on a line

**Manufactured Date of Material**

- Block Title: MANUFACTURING DATE
- Data: Date product produced
- Text Height: 3 LPB
- Max. Chars: 8 Chars on a line

**Description of Part**

- Block Title: DESCRIPTION
- Data: Part description
- Text Height: 5 LPB
- Max. Chars: 2 lines of text, up to 36 chars on a line

**Customer Name**

- Block Title: CVG Supplier Quality
- Data: CVG PLANT
- Text Height: 3 LPB
- Max. Chars: 8 Chars on a line

**Authorized By**

- Block Title: CVG Supplier Quality
- Data: CVG SUPPLIER
- Text Height: 3 LPB
- Max. Chars: 8 Chars on a line

**Revision**

- Data: CVGLBL-002
- Issue Date: 12/05/2008
## ATTACHMENT 6 – Mixed Load Label

### Mixed Load Label

**CVG PLANT**  
7800 WALTON PARKWAY  
NEW ALBANY, OH  43054

---

**Label Title & Purpose:** Mixed Load Label  
Label format to be used when a container(s) include multiple part numbers

**Authorized By:** CVG Supplier Quality  
Issue Date: 12/05/2008  
Revision: Original  
Document Number: CVGLBL-004

### Description of Load

- **Customer Name:** CVG PLANT
- **Sender's Address:** ANY TOWN, ANY STREET, ANY TOWN, US 98765
- **Load Identification:** PKG ID – MIXED
- **Customer's Address:** CVG PLANT  
7800 WALTON PARKWAY  
NEW ALBANY, OH  43054
- **Max. Chars:** 11 chars on a line
- **Text Height:** 1 LPB
- **Block Title:** MIXED LOAD

### Load Identification

- **Block Title:** PKG ID – MIXED  
**Data:** Multiple part numbers
- **Max. Chars:** 11 chars on a line
- **Text Height:** 1 LPB
- **Block Title:** VENDOR ID CUST  
**Data:** Supplier assigned ID tracking number
- **Max. Chars:** 17 Chars + 2

### Supplier Identification

- **Block Title:** VENDOR ID CUST  
**Data:** Supplier assigned ID
- **Max. Chars:** 6 Chars + 1

### Recipient's Address

- **TO:** Customer's address
- **Block Title:** TO  
**Data:** Customer's address
- **Max. Chars:** 4 lines of text, up to 15 chars on a line
- **Text Height:** 4 LPB

---

**NOTE:** Illustration is to scale. Any dimensions that are not otherwise specified on this page SHALL be in compliance with the latest release of this guideline.

---

*All Bar Codes shall be Code 39 Symbology*

*All Bar Codes shall be .5 inches (12.7mm) in height*

*All Bar Codes shall use a narrow element size as defined in AIAG B-10 Revision 3*

*Unless otherwise specified, human readable interpretation of all Bar Codes should be 20 point font size, all upper case.

---

### VS Inventory

- **Supplier ID:** 1350069925811
- **Vendor ID:** 363555

---

### VS Address

- **Sender:** 123 ANYWHERE STREET  
ANY TOWN, US  98765
- **Recipient:** CVG PLANT  
7800 WALTON PARKWAY  
NEW ALBANY, OH  43054
INTERNAL CONTAINER LABEL

* All Bar Codes shall be Code 39 Symbology
* All Bar Codes shall be .25 inches (6.35mm) in height
* All Bar Codes shall use a narrow element size as defined in AIAG B-10 Revision 3
* Unless otherwise specified, human readable interpretation of all Bar Codes should be 12 point font size, all upper case.

* All Bar Codes shall use a narrow element size no less than 0.010” (.25mm)
* Label to be used on labeling surface areas of less than thirty six (36) square inches only.
* Depicted label size is 2” (50.8mm) in height by 3” (76.2mm) wide.

<table>
<thead>
<tr>
<th>Customer Name</th>
<th>Label Title &amp; Purpose</th>
<th>Internal Container label</th>
<th>NOTE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial Vehicle Group</td>
<td>Label format to be used when there are sub-packages internal to the primary container that requires labeling</td>
<td>Illustration is to scale. Any dimensions that are not otherwise specified on this page SHALL be in compliance with the latest release of this guideline.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Authorized By</th>
<th>Issue Date</th>
<th>Revision</th>
<th>Document Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>CVG Supplier Quality</td>
<td>12/05/2008</td>
<td>Original</td>
<td>CVGLBL-005</td>
</tr>
<tr>
<td>Data Identifier</td>
<td>Suggested Short Title</td>
<td>Maximum Recommended Data Length</td>
<td>Comments</td>
</tr>
<tr>
<td>-----------------</td>
<td>-----------------------</td>
<td>---------------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>K</td>
<td>P.O. # (K)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5K</td>
<td></td>
<td></td>
<td>Purchase Order Number, customer assigned</td>
</tr>
<tr>
<td>15K</td>
<td>PULL SIGNAL # (15K)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P</td>
<td>PART # CUST (P)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1P</td>
<td>PART # SPLR (1P)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2P</td>
<td>EC # (2P)</td>
<td></td>
<td>Code assigned to specify the revision level of the part</td>
</tr>
<tr>
<td>10P</td>
<td></td>
<td></td>
<td>Hazardous Material Code as defined by ANSI X12.3</td>
</tr>
<tr>
<td>Q</td>
<td>QUANTITY (Q)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1Q</td>
<td>LENGTH (1Q) or THEORETICAL WEIGHT (1Q)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2Q</td>
<td>ACTUAL WEIGHT (2Q)</td>
<td></td>
<td>Actual Weight</td>
</tr>
<tr>
<td>7Q</td>
<td>QTY + U/M (7Q)</td>
<td></td>
<td>Quantity and unit of measure in the format: Quantity followed by the two-character Unit of Measure code as defined ANSI X12.3</td>
</tr>
<tr>
<td>11Q</td>
<td>TARE WT. (11Q)</td>
<td></td>
<td>Tare Weight: weight of an empty container</td>
</tr>
<tr>
<td>S</td>
<td>SERIAL # (S)</td>
<td></td>
<td>Serial Number assigned by the supplier to an entity for its lifetime</td>
</tr>
<tr>
<td>3S</td>
<td>PKG ID – UNIT (3S)</td>
<td>9</td>
<td>Package Identification assigned by the supplier to the lowest level of packaging that has a package ID code</td>
</tr>
<tr>
<td>4S</td>
<td>PKG ID – MASTER (4S)</td>
<td>9</td>
<td>Package Identification assigned by the supplier to packaging containing multiple containers of like items on a single customer order</td>
</tr>
<tr>
<td>5S</td>
<td>PKG ID – MIXED (5S)</td>
<td>9</td>
<td>Package Identification assigned by the supplier to packaging containing multiple containers of unlike items on a single customer order</td>
</tr>
<tr>
<td>1T</td>
<td>LOT # SPLR (1T) or HEAT # SPLR (1T)</td>
<td>18</td>
<td>Traceability number assigned to a unique batch or group of items by the supplier or manufacturer</td>
</tr>
<tr>
<td>V</td>
<td>VENDOR ID CUST ASGN (V)</td>
<td></td>
<td>Supplier Code assigned by the customer</td>
</tr>
</tbody>
</table>

ATTACHMENT 8 – Data Identifiers Listing
### ATTACHMENT 10 – Font Size Terminology

<table>
<thead>
<tr>
<th>Lines Per Block</th>
<th>Maximum Characters Per Line</th>
<th>Approximate Point Height</th>
<th>Approximate Height in Inches</th>
<th>Approximate Height in Millimeters</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 LPB</td>
<td>8</td>
<td>64</td>
<td>0.90</td>
<td>22.0</td>
</tr>
<tr>
<td>2 LPB</td>
<td>18</td>
<td>32</td>
<td>0.40</td>
<td>11.0</td>
</tr>
<tr>
<td>3 LPB</td>
<td>28</td>
<td>20</td>
<td>0.25</td>
<td>7.0</td>
</tr>
<tr>
<td>4 LPB</td>
<td>34</td>
<td>16</td>
<td>0.20</td>
<td>5.0</td>
</tr>
<tr>
<td>5 LPB</td>
<td>42</td>
<td>12</td>
<td>0.15</td>
<td>4.0</td>
</tr>
<tr>
<td>6 LPB</td>
<td>48</td>
<td>10</td>
<td>0.12</td>
<td>3.0</td>
</tr>
<tr>
<td>7 LPB</td>
<td>59</td>
<td>8</td>
<td>0.10</td>
<td>2.0</td>
</tr>
<tr>
<td>8 LPB</td>
<td>68</td>
<td>6</td>
<td>0.08</td>
<td>1.5</td>
</tr>
</tbody>
</table>
### ATTACHMENT 11 – Oceanic Container Specifications

#### Conversion Table

<table>
<thead>
<tr>
<th>Convert From:</th>
<th>To:</th>
<th>Multiply By:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cubic Feet</td>
<td>Cubic Meters</td>
<td>0.028317</td>
</tr>
<tr>
<td>Cubic Meters</td>
<td>Cubic Feet</td>
<td>35.3145</td>
</tr>
<tr>
<td>Short Tons</td>
<td>Metric Tones</td>
<td>0.9072</td>
</tr>
<tr>
<td>Metric Tons</td>
<td>Short Tons</td>
<td>1.102</td>
</tr>
<tr>
<td>Pounds</td>
<td>Kilograms</td>
<td>0.4536</td>
</tr>
<tr>
<td>Kilograms</td>
<td>Pounds</td>
<td>202046</td>
</tr>
<tr>
<td>Centimeters</td>
<td>Inches</td>
<td>0.3937</td>
</tr>
<tr>
<td>Inches</td>
<td>Centimeters</td>
<td>2.54</td>
</tr>
<tr>
<td>Inches</td>
<td>Meters</td>
<td>0.0254</td>
</tr>
<tr>
<td>Meters</td>
<td>Inches</td>
<td>39.37</td>
</tr>
<tr>
<td>Meters</td>
<td>Feet</td>
<td>3.281</td>
</tr>
<tr>
<td>Long Tons</td>
<td>Metric Tons</td>
<td>1.016</td>
</tr>
<tr>
<td>Metric Tons</td>
<td>Long Tons</td>
<td>0.9842</td>
</tr>
<tr>
<td>Measurement Tons</td>
<td>Cubic Tons</td>
<td>1.1327</td>
</tr>
</tbody>
</table>

#### Metric Container Dimensions

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Interior Dimensions</th>
<th>Door Opening</th>
<th>Top Opening</th>
<th>Tare Weight</th>
<th>Cubic Capacity</th>
<th>Payload</th>
</tr>
</thead>
<tbody>
<tr>
<td>20' Standard Container</td>
<td>L: 5.919 m, W: 2.340 m, H: 2.380 m</td>
<td>W: 2.286 m, H: 2.278 m</td>
<td>1,900 kg</td>
<td>33.0 cbm</td>
<td>22,100 kg</td>
<td></td>
</tr>
<tr>
<td>40' Standard Container</td>
<td>L: 12.051 m, W: 2.340 m, H: 2.380 m</td>
<td>W: 2.289 m, H: 2.278 m</td>
<td>3,084 kg</td>
<td>67.3 cbm</td>
<td>27,397 kg</td>
<td></td>
</tr>
<tr>
<td>40' High Cube</td>
<td>L: 12.056 m, W: 2.347 m, H: 2.684 m</td>
<td>W: 2.340 m, H: 2.585 m</td>
<td>2,900 kg</td>
<td>76.0 cbm</td>
<td>29,600 kg</td>
<td></td>
</tr>
<tr>
<td>45' High Cube</td>
<td>L: 13.582 m, W: 2.347 m, H: 2.690 m</td>
<td>W: 2.340 m, H: 2.584 m</td>
<td>4,110 kg</td>
<td>85.7 cbm</td>
<td>28,390 kg</td>
<td></td>
</tr>
<tr>
<td>20' Open Top</td>
<td>L: 5.919 m, W: 2.340 m, H: 2.286 m</td>
<td>W: 2.286 m, H: 2.278 m</td>
<td>L: 5.425 m, W: 2.222 m</td>
<td>2,174 kg</td>
<td>31.6 cbm</td>
<td>21,826 kg</td>
</tr>
<tr>
<td>40' Open Top</td>
<td>L: 12.043 m, W: 2.338 m, H: 2.272 m</td>
<td>W: 2.279 m, H: 2.272 m</td>
<td>L: 11.585 m, W: 2.162 m</td>
<td>4,300 kg</td>
<td>64.0 cbm</td>
<td>25,181 kg</td>
</tr>
<tr>
<td>40' Reefer</td>
<td>L: 11.207 m, W: 2.246 m, H: 2.183 m</td>
<td>W: 2.216 m, H: 2.183 m</td>
<td>4,600 kg</td>
<td>54.9 cbm</td>
<td>25,881 kg</td>
<td></td>
</tr>
<tr>
<td>40' High Cube Reefer</td>
<td>L: 11.557 m, W: 2.286 m, H: 2.491 m</td>
<td>W: 2.286 m, H: 2.454 m</td>
<td>4,320 kg</td>
<td>65.8 cbm</td>
<td>28,180 kg</td>
<td></td>
</tr>
<tr>
<td>20' Flat Rack</td>
<td>L: 5.702 m, W: 2.438 m, H: 2.327 m</td>
<td></td>
<td>2,330 kg</td>
<td></td>
<td>21,670 kg</td>
<td></td>
</tr>
<tr>
<td>40' Flat Rack</td>
<td>L: 11.820 m, W: 2.148 m, H: 2.095 m</td>
<td></td>
<td>5,260 kg</td>
<td></td>
<td>25,220 kg</td>
<td></td>
</tr>
<tr>
<td>40' Collapsible Flat Rack</td>
<td>L: 12.08 m, W: 2.126 m, H: 2.043 m</td>
<td></td>
<td>5,800 kg</td>
<td></td>
<td>29,200 kg</td>
<td></td>
</tr>
<tr>
<td>45' High Cube Container</td>
<td>L: 13.102 m, W: 2.294 m, H: 2.509 m</td>
<td>W: 2.290 m, H: 2.467 m</td>
<td>5,200 kg</td>
<td>75.4 cbm</td>
<td>27,300 kg</td>
<td></td>
</tr>
</tbody>
</table>
ATTACHMENT 13 – “387” Bunk Packaging Specification

- **General Notes**
  - Metric Dimensions are in parenthesis ( ).
  - Type of wood – Open.
    - Pallet should withstand typical handling.
    - Pallet should withstand the weight of 17 bunks.
  - Pallets shall conform to ISPM 15.

- **Pallet Notes**
  - Board to be void of the following defects:
    - Cracks greater than 6 inches (152mm) in board direction.
    - Cracks greater than 2 inches (51mm) in cross board direction.
    - Holes greater than 3 inches (72mm) in diameter.
  - The following dimensions are intended to be minimums:
    - 1.25 inches for the pallet board thickness.
    - Nail dimensions.

- **Bunk Packaging Notes**
  - Bunk stack to be 17 high.
  - Each bunk to be individually banded with three strips of cardboard, two on the ends and one in the middle.
  - Entire bunk stack to be banded three ways vertically, and two ways across the stack.
  - Every two bunks to be banded together for additional support.
  - Band strap to go underneath pallet, fastening bunks to pallet.
  - Entire bunk stack to be wrapped in corrugated board and shrink wrapped.
  - Open end of the bottom bunk is to face the skid.

Cracks are where the woods split on the top surface. These should not be greater than 6” (152 mm) long.

Holes are voids that go all the way through the board. The hole should not be greater than 3” (76mm) wide in any direction.

Cracks that go across the board should not be more than 2” in length.
Pallet spec (mm)

Top View

3 bottom boards
(32 x 101 x 914 +/- 50)

Nails
(3mm thick, 50mm long)
3 at each connection

Top boards
(min quantity 4
max quantity 6)
(32 x 152 x 2324 +/- 50)

Bottom boards

1.25"
(32mm)

1.25"
(32mm)

6"
(152mm)
Each individual bunk to be wrapped with corrugated strip dividers on the left and right ends.

Corrugated strips to be minimum 8" (203mm) wide, and make a complete circle around the bunk.

They can still be banded two bunks at a time, but the board must wrap around each individual bunk.

Corrugated dividers to extend over sides at least 2" (50mm).
3 rows of corrugated board.

Every two bunks banded together.

Example of banding for entire skid.
Additional corner protectors to be added after banding stack, prior to final wrap around of board and shrink wrap.

Product finally to be surrounded with corrugated board and shrink wrapped with plastic.

4 corner protectors for reinforcement. Each side comes out from the corner 3" (76mm).