

This module explains Delphi-E&S containerization requirements that Suppliers need to understand and follow.

We will start out with a basic review of containerization. We will then review parts of the Delphi Global Packaging and Shipping Manual. You are expected to read all of the material on your own and ensure that you understand it.

Information on accessing electronic resources is included at the end of the module. Contact information is also included in this section.

Let's begin by defining containerization.

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Containerization

◆ Containerization

- Packaging parts in the smallest lot possible resulting in presentation of a quality part that eliminates waste of motion for the manufacturing operator
- Examples of containerization are a container, tray, tube or bag

◆ Overall containerization goal

- Presenting parts that factor in operator ergonomics and work cell efficiency
- Protecting the quality of the parts at the overall lowest system cost

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Supplier Training

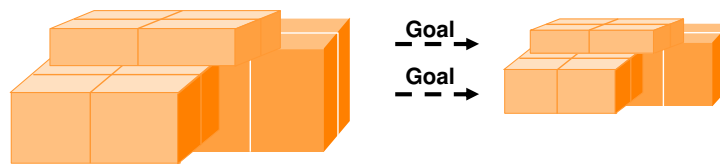
Ideally, the part should be in the orientation that causes the least amount of motion for the operator placing the part into the final product.

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Containerization

◆ Smaller containers impact quality and customer value by:

- Supporting small lot production
- Improving response time
- Complementing lean manufacturing
- Allowing workplace layout improvements
- Facilitating standardized work
- Supporting dock to line flow
- Reducing line side and plant inventory
- Improving ergonomics



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The goal is to use the smallest container possible. This reduces waste and cost and also improves efficiency.

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Packaging Development Process

◆ New Parts

- Suppliers must submit a *Supplier Packaging Information (SPI) Form* for each part to Delphi-E&S Purchasing for all quotations
 - » *SPI Form* represents an agreement between Delphi-E&S and the Supplier regarding the containerization plan for products received by Delphi-E&S manufacturing facilities
 - » *SPI Form* contains standard packaging information (standard pack quantity, size, material type, cost, etc.)
- All exceptions or requests for deviations to packaging requirements must be approved by Delphi-E&S Inbound Packaging Engineering

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Supplier Training

This is the Packaging Development Process that suppliers are to follow for new parts. Be sure you understand this process.

Information to access the *Delphi Global Packaging and Shipping Manual* is included at the end of this module.

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Packaging Development Process

◆ Current Parts

- Suppliers must submit to Delphi-E&S Purchasing all packaging data in standard format on *SPI Form*
 - » The original is kept with the quote package for documentation of the current containerization plan for the part
- Changes to product part number, quantities, packaging materials or dimensions require a re-submittal of *SPI Form* and approval from Inbound Packaging Engineering

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Supplier Training

This is the Packaging Development process that suppliers need to follow for current parts. Information to access the *SPI Form* as well as *SPI* Instructions is included at the end of this module.

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SPI form

- ◆ The *Supplier Packaging Information Form* is shown at the right

DELPHI SUPPLIER PACKAGING INFORMATION			
DELPHI PROVIDED INFORMATION <input type="checkbox"/> Initial Submission <input type="checkbox"/> Change			
DELPHI CONTACT NAME	CONTACT PHONE NUMBER	E-MAIL / FAX	DATE SUBMITTED
DELPHI ORF	DELPHI REQUIRED CONTAINER	EST STD PACK QTY	PACK OPTION <input checked="" type="checkbox"/> Expendable <input type="checkbox"/> Returnable
SPECIAL PACKAGING REQUIREMENTS			
ADDITIONAL COMMENTS		PART/VEIGHT	<input type="checkbox"/> Additional Parts Attached
EXPENDABLE PACK REQUESTED: provide INFO for Expendable packaging and PRICES for BOTH Expendable and Returnable Pack Options if			
SUPPLIER PROVIDED INFORMATION <input type="checkbox"/> Initial Submission <input type="checkbox"/> Change			
SUPPLIER COMPANY NAME	CONTACT NAME	CONTACT PHONE NUMBER	E-MAIL / FAX
COMPANY ADDRESS	SHIPPING ADDRESS (if different)		CURT NUMBER
PROGRAM / MODEL YEAR	PART DESCRIPTION	PART L V L N	
PART NUMBER (S)	VOLUME	SHIP FREQ	<input checked="" type="checkbox"/> Daily <input type="checkbox"/> Other
RETURNABLE PACK INFORMATION EXPENDABLE MATERIAL COST PER PIECE \$ (USD)			
PRIMARY CONTAINER TYPE	ID #	DVN	TARE/V/T MATERIAL (c/a)
DURANCE TYPE	ID #	DVN	TARE/V/T MATERIAL (c/a)
DURANCE TYPE	ID #	DVN	TARE/V/T MATERIAL (c/a)
SECONDARY CONTAINER TYPE	ID #	DVN	TARE/V/T MATERIAL (c/a)
STANDARD PACK QUANTITY	NO. OF PRIMARY CONTAINERS/LAYER	NO. OF LAYERS ON/IN SECONDARY CONTAINER	
PART/VEIGHT	PRIMARY CRT GROSS/VEIGHT	SECONDARY CRT GROSS/VEIGHT	METHOD TO SECURE LOAD MATERIAL (c/a)
EXPENDABLE PACK INFORMATION EXPENDABLE MATERIAL COST PER PIECE \$ (USD)			
PRIMARY CONTAINER TYPE	ID #	DVN	TARE/V/T MATERIAL (c/a)
DURANCE TYPE	ID #	DVN	TARE/V/T MATERIAL (c/a)
DURANCE TYPE	ID #	DVN	TARE/V/T MATERIAL (c/a)
SECONDARY CONTAINER TYPE	ID #	DVN	TARE/V/T MATERIAL (c/a)

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The *Supplier Packaging Information Form* is shown in the slide above.

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SPI form

- Click on the tabs along the bottom to access

- Instructions
- The SPI form
- Other information

SUPPLIER PROVIDED INFORMATION:

☐ Initial Submission ☐ Change

SUPPLIER COMPANY NAME	CONTACT NAME	CONTACT PHONE NUMBER	EMAIL / FAX	DATE
COMPANY ADDRESS		SHIPPING ADDRESS (IF DIFFERENT)		DUNS NUMBER
PROGRAM / MODEL YEAR		PART DESCRIPTION		PART L x W x H
PART NUMBER (S)		VOLUME	SHIP FREQ <input checked="" type="checkbox"/> Daily <input type="checkbox"/> Other	

RETURNABLE PACK INFORMATION

EXPENDABLE MATERIAL COST PER PIECE \$ (USD)

PRIMARY CONTAINER TYPE	ID #	LWH	TARE WT	MATERIAL
(n/a)	▼			(n/a) ▼
DUNNAGE TYPE	ID #	LWH	TARE WT	MATERIAL
(n/a)	▼			(n/a) ▼
DUNNAGE TYPE	ID #	LWH	TARE WT	MATERIAL
(n/a)	▼			(n/a) ▼
SECONDARY CONTAINER TYPE	ID #	LWH	TARE WT	MATERIAL
(n/a)	▼			(n/a) ▼
STANDARD PACK QUANTITY		NO. OF PRIMARY CONTAINERS/LAYER		NO. OF LAYERS ON IN SECONDARY CONTAINER
PART WEIGHT	PRIMARY CONT GROSS WEIGHT	SECONDARY CONT GROSS WEIGHT	METHOD TO SECURE LOAD	MATERIAL
			(n/a) ▼	(n/a) ▼

EXPENDABLE PACK INFORMATION

EXPENDABLE MATERIAL COST PER PIECE \$ (USD)

PRIMARY CONTAINER TYPE	ID #	LWH	TARE WT	MATERIAL
(n/a)	▼			(n/a) ▼
DUNNAGE TYPE	ID #	LWH	TARE WT	MATERIAL
(n/a)	▼			(n/a) ▼
DUNNAGE TYPE	ID #	LWH	TARE WT	MATERIAL
(n/a)	▼			(n/a) ▼
SECONDARY CONTAINER TYPE	ID #	LWH	TARE WT	MATERIAL
(n/a)	▼			(n/a) ▼
STANDARD PACK QUANTITY		NO. OF PRIMARY CONTAINERS/LAYER		NO. OF LAYERS ON IN SECONDARY CONTAINER
PART WEIGHT	PRIMARY CONT GROSS WEIGHT	SECONDARY CONT GROSS WEIGHT	METHOD TO SECURE LOAD	MATERIAL
			(n/a) ▼	(n/a) ▼

Instructions SPI <= Suppliers !! Delphi => Form Index Form - Special Rqmts Ref - Std Ctnr NA Ref - Std Ctnr Metric

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Supplier Training

By clicking on the tabs at the bottom of the form, you will have access to SPI Instructions, the SPI Form and other SPI information.

If you have any questions concerning packaging and Delphi-E&S requirements, refer to the contact information at the end of this training.

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General:

- ◆ Supplier is responsible for ensuring quality of material throughout the material movement process. If part quality is compromised, the supplier may be held liable for repacking, inspection, and incremental freight costs.
- ◆ Supplier must complete in its entirety a Delphi Supplier Packaging Information (SPI) form with all part submissions. Changes to part number, quantities, packaging materials, or dimensions require a re-submittal of the SPI form (follow SCR process).
- ◆ When using returnable packaging, Supplier must plan and maintain sufficient supply of back up expendable packaging. This packaging must be the same size or smaller and the same standard pack quantity as the returnable. Alternate pricing for expendable packaging costs must be prearranged with Delphi Global Supply Management
- ◆ No price increases will be granted to correct defective and/or non-conforming packaging. This applies in all cases whether or not Delphi has provided assistance or approval of the SPI form or if the supplier has chosen to use the Delphi Testing Laboratory for validation.
- ◆ All packaging pricing must be negotiated with Delphi Global Supply Management.
- ◆ The Delphi Problem Solver web-based system will be used to quickly communicate problems to suppliers and to initiate fast, complete problem resolution. This also serves as a platform for Supplier Performance Rating

The next half dozen Supplier Packaging Quick Reference slides detail some highlights from the Delphi Global Packaging and Shipping Manual. Again, not all of the information from the manual will be covered so please ensure that you familiarize yourself with the entire manual on your own.

Let's start by looking at some of the General Requirements.

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General Containers:

- ◆ All containers coming into a Delphi facility must be chosen from the Delphi Standard Container menu (Pages 31-33).
- ◆ Containers should be as small as possible.
- ◆ To ensure part integrity, the packaging should be validated by testing with simulation &/or real life conditions (recommended validation is ASTM & ISTA).
- ◆ Required deviations to the standard container menus must be approved by Delphi's Divisional Supplier Packaging Leader.
- ◆ Maximum container weight is now determined by the combination of the container size and the frequency handled per Weight Trigger calculation (Pages 9-10).
- ◆ Supplier must comply to label standards that are located in the Delphi Covisint Supplier Community Portal.
- ◆ Maximum weight of any load (containers plus pallet) is 2000 lbs. (907.18 kg) (Page 20).

This slide details some of the General Container Requirements found in the Delphi Global Packaging and Shipping Manual.

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Expendable Containers:

- ◆ A minimum 44 Edge Crush Test (ECT) is required for corrugated containers (Page 17).
- ◆ Half Slotted Containers (HSCs) are strongly preferred for safety purposes. One common cover over each full layer of cartons on a pallet is the preferred method. Individual lids may be required in some cases. Use of uncovered HSCs is not acceptable.
- ◆ Container closure must be taped or glued with no stapling.
- ◆ Cartons should be secured to a pallet using polyester strapping. A minimum of two vertical bands lengthwise and two vertical bands widthwise must be used.
- ◆ Stretch wrap must be clear, linear, low density, polyethylene.
- ◆ Expendable back-up packaging is required for all returnable programs.

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This slide covers some of the Expendable Container Requirements from the Delphi Global Packaging and Shipping Manual.

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Returnable Containers:



◆ Benefits

- Eliminates the cost of purchasing and the labor of building expendable packaging.
- Provides a piece price savings to both Delphi-E&S and the Supplier.
- Provides increased protection to the part.
- Eliminates waste of detrashing and repacking.
- Provides an environmentally friendly option to expendable packaging.

◆ Factors to consider for justifying the use of returnable packaging

- Cost – Volumes, Program length, Quality, Current shipping cost, Price per piece, Expendable packaging waste elimination, Distance between Supplier and Delphi-E&S manufacturing site
- Ergonomics - Risk of Injury, Ease of handling

◆ Justification Determination

- Inbound Packaging Engineering works with the Supplier and the Delphi-E&S manufacturing site to determine if returnable packaging is feasible. A cost benefit analysis is run and other intangible factors are taken into account.

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The next two slides cover some details from the Returnable Container section of the Delphi Global Packaging and Shipping Manual.

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Returnable Containers:



◆ Supplier responsibilities

- Design and purchase dunnage (partitions, trays, etc.) needed for the packaging
- Clean returnable containers, including residue and expendable dunnage, when required
 - » Routine checks should be made
 - » Regular cleaning should occur as needed to ensure part quality and cleanliness during life of container
- Load production parts into only clean, undamaged containers
- Load container systems into transportation equipment in a manner that maintains part quality
 - » Remove damaged unit immediately from the system
 - » Contact receiving plant's material personnel for repair
 - » Remove all one-time shipment labels on returnable packaging
- Store containers in a manner that
 - » Allows ease of inventories
 - » Maintains cleanliness
 - » Protects containers from excessive environmental exposure
- Track and trace returnable containers; and communicate to Delphi any discrepancies

◆ Delphi Responsibilities

- Provide totes and pallets for the returnable loop
- Approve system size and returnable system proposals

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This slide also covers some details from the Returnable Container section of the Delphi Global Packaging and Shipping Manual.

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Pallets:

- ◆ All pallets coming into a Delphi facility must be chosen from the Delphi Standard Pallet menu (Page 34).
- ◆ Pallets must comply to ISPM#15 regardless of country origin or destination (Page 14).
- ◆ "DO NOT STACK" labels are prohibited (Page 19).
- ◆ Palletized material must stack 2 pallets high in transport and 3 pallets high in storage.
- ◆ Required deviations to the standard pallet or container menus must be approved by Delphi's Divisional Supplier Packaging Leader.
- ◆ Material destined for mixed destinations may not be consolidated on one pallet (Page 23).
- ◆ If shipping mixed loads, mixed load labels (affixed to the load on two adjacent corners) and a master label must be on the pallet.
- ◆ If shipping partial layer, and the layer is greater than 2/3 filled, use empty containers to fill out layer. If less than 2/3 filled, the containers should be palletized separately leaving the remaining layers level.
- ◆ Brick stacking, overhang, and pyramid stacking on pallet is prohibited. Level layer is required (Page 19).
- ◆ Maximum load heights must not exceed 52" or 1322 mm.

Here are some of the highlighted Pallet Requirements from our manual.

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Common Packaging Errors

- ◆ The Supplier Packaging Information (SPI) Form is not completed
- ◆ Container and pallet sizes are not selected from the standard menus
 - Does not allow for full trailer cube utilization
- ◆ Non-standard palletizing practices are used
 - Misalignment on pallet – results in 29% compression loss for 1" non-alignment
 - Overhang – results in 32% compression loss for 1" material overhang
 - Brick Stacking – results in up to 50% compression loss
- ◆ Do Not Stack Labels are used due to insufficient packaging design
 - Does not allow for full trailer cube utilization
- ◆ Pallet loads are shipped in uneven layers
 - Does not allow for full trailer cube utilization
- ◆ Full container and/or pallet weight exceeds limit
 - Increases possibility of part damage
 - Presents ergonomic issues at using plant
- ◆ Full pallet height exceeds 52 inches
 - Does not allow for full trailer cube utilization
- ◆ Incorrect banding material is used
- ◆ Delphi-E&S part number labels are not included on inner pack boxes

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Supplier Training

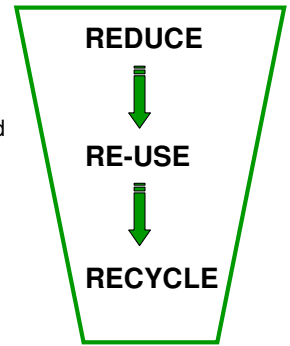
These are the most common packaging errors that are seen.

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Common Packaging Errors

♦ Wasteful, excessive or non-recyclable packaging is used

- Corrugated carton test strength greatly exceeds requirement
- Use of multiple overpack containers or bags
- Proposed standard pack quantity does not correspond with the pitch of the line on high dollar items
- Incorrect part orientation which requires twisting and turning by the operator
- Use of non-recyclable materials
- Use of multiple types of recyclable materials which require sorting
- Excessive tape
- Oversized foam, plastic or corrugated dunnage
- Foam wrap and bubble wrap
- Plastic protective covers, caps, plugs, paint masks or spacers required in the manufacturing process, but not required as a protective shipping device



Hierarchy of Waste Elimination

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Multiple overpack boxes

Example:

Reels are typically packaged in a bag, in a box, and then multiple boxes inside another box. Eliminate outside box and ship multiple part numbers in one larger box or returnable.

Pitch is the cadence of the line and is based on the quantity of product shipped. Pitch minimizes the amount of parts left over after a changeover and facilitates storage and handling. Smaller lots improve information flow and responsiveness.

Example:

Product is shipped out in containers with 24 pieces. Therefore, your pitch is 24 and all product should be shipped in multiples of 24 (24, 48, 72, etc.)

Multiple types of recyclable or non-recyclable material requiring sorting

Example:

Parts are in a plastic tray, plastic tray is inside a bag, bag is within a cardboard box, box is surrounded by peanuts inside another box. Plastic tray is a recyclable plastic, bag is a throw away, cardboard boxes both are recyclable, and peanuts depending on type can be recycled or re-used. This requires sorting and at least four different containers to sort into.

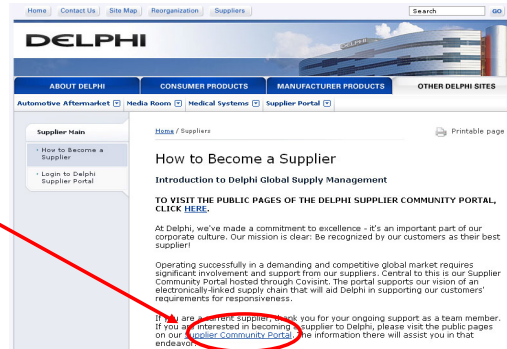
DELPHI

Accessing Web Resources

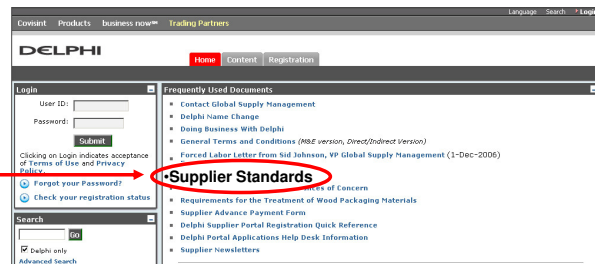
www.delphi.com/suppliers

- ◆ Access the Delphi Corporate web site:
www.delphi.com/suppliers

- ◆ Click on **Supplier Community Portal**



- ◆ From the *Frequently Used Documents* section, click on **Supplier Standards**



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The next few slides will explain how to access both the *Delphi Global Packaging and Shipping Manual* and the *Supplier Packaging Information (SPI) Form*.

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Accessing Web Resources

- ◆ The *Delphi Supplier Standards* screen will display. Scroll down to **PACKAGING** and access the *Delphi Supplier Packaging Information (SPI) Form* and the *Delphi Global Packaging and Shipping Manual*

PACKAGING		
	Delphi Global Packaging and Shipping Manual Have a question regarding the Delphi Global Packaging & Shipping Manual? Contact Laura Wenz at laura.a.wenz@delphi.com . If the manual doesn't open in a timely manner you may want to download and save a copy instead. Just right-click on the link, then select "Save Target As..." from the context menu.	
	Delphi Supplier Packaging Information Form Complete the form, save and submit (hard copy or e-mail) to your Delphi Global Supply Management contact. If the SPI form doesn't open in a timely manner you may want to download and save a copy instead. Just right-click on the link, then select "Save Target As..." from the context menu.	

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The Delphi Supplier Standards information will display. Scroll down the page until you reach PACKAGING. The links for the *Delphi Global Packaging and Shipping Manual* and the *Delphi Supplier Packaging Information (SPI) Form* are located there. Follow the instructions to view or download this information.

The *SPI Form* can be filled out and submitted electronically.

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Inbound Packaging Contacts

- ◆ **German Mondaca**
Inbound Packaging Engineer
915-512-8847
german.mondaca@delphi.com
- ◆ **Jesus E Sanchez**
Inbound Packaging Engineer
915-612-7824
jesus.e.sanchez@delphi.com
- ◆ **Pedro A Torres**
Inbound Packaging Engineer
915-612-8018
pedro.a.torres@delphi.com

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Supplier Training

These individuals are your Delphi-E&S packaging contacts. Please feel free to contact them with packaging related questions.

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Questions and Answers

If you have additional questions regarding SAP after the training session, please contact the Delphi Electronics & Safety SAP Support Team:
delco.vega.support.kokomo@delphi.com