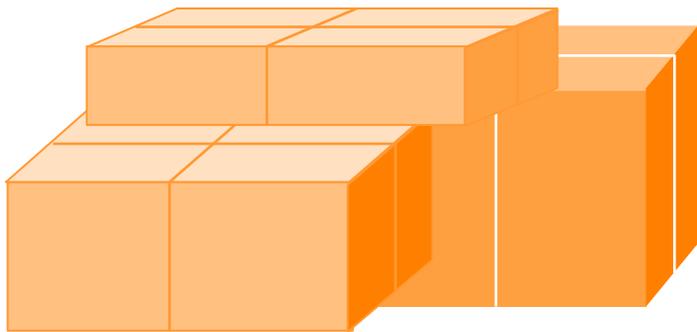


**DELPHI**

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# Containerization



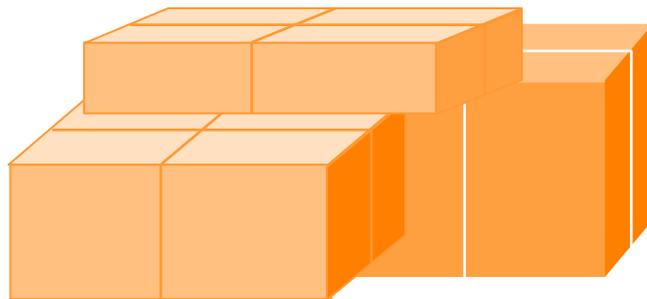
### ◆ Containerization

- 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

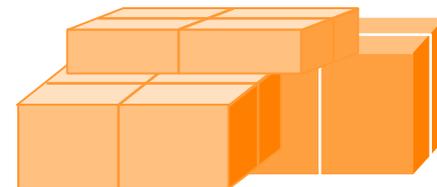
### ◆ Overall containerization goal

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

- ◆ 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



Goal →  
Goal →



**◆ 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

**◆ 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

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

DELPHI SUPPLIER PACKAGING INFORMATION				
<b>DELPHI PROVIDED INFORMATION</b> <input type="checkbox"/> Initial Submission <input type="checkbox"/> Change				
DELPHI CONTACT NAME	CONTACT PHONE NUMBER	E-MAIL / FAX	DATE SUBMITTED	
RFO (or 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 WEIGHT	<input type="checkbox"/> Additional Rqmts Attached
EXPENDABLE PACK REQUESTED: provide INFO for Expendable packaging and PRICES for BOTH Expendable and Returnable Pack Options /				
<b>SUPPLIER PROVIDED INFORMATION</b> <input type="checkbox"/> Initial Submission <input type="checkbox"/> 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		
<b>RETURNS INFORMATION</b> 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)
<b>EXPENDABLE PACK INFORMATION</b> 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)
Instructions   SPI   <= Suppliers !! Delphi =>   Form Index   Form - Special Rqmts   Ref - Std Ctr NA   Ref - Std Ctr Metric				

# DELPHI

# 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 (n/a) ▼	ID #	LWH	TARE WT	MATERIAL (n/a) ▼
DUNNAGE TYPE (n/a) ▼	ID #	LWH	TARE WT	MATERIAL (n/a) ▼
DUNNAGE TYPE (n/a) ▼	ID #	LWH	TARE WT	MATERIAL (n/a) ▼
SECONDARY CONTAINER TYPE (n/a) ▼	ID #	LWH	TARE WT	MATERIAL (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 (n/a) ▼	MATERIAL (n/a) ▼

EXPENDABLE PACK INFORMATION		EXPENDABLE MATERIAL COST PER PIECE \$ (USD)		
PRIMARY CONTAINER TYPE (n/a) ▼	ID #	LWH	TARE WT	MATERIAL (n/a) ▼
DUNNAGE TYPE (n/a) ▼	ID #	LWH	TARE WT	MATERIAL (n/a) ▼
DUNNAGE TYPE (n/a) ▼	ID #	LWH	TARE WT	MATERIAL (n/a) ▼
SECONDARY CONTAINER TYPE (n/a) ▼	ID #	LWH	TARE WT	MATERIAL (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 (n/a) ▼	MATERIAL (n/a) ▼

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



## 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 it's 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

## 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).

## 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.

## 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.

### 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

#### ◆ Delphi Responsibilities

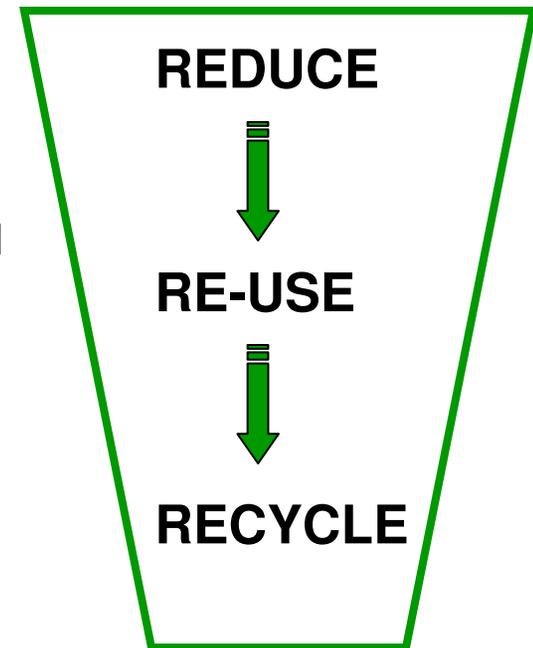
- Provide totes and pallets for the returnable loop
- Approve system size and returnable system proposals

## 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.

- ◆ 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

- ◆ 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



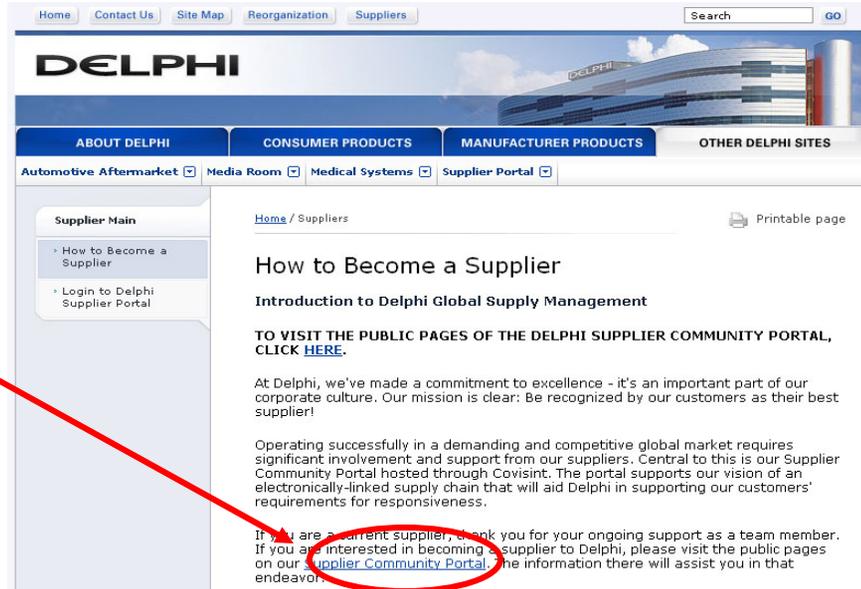
**Hierarchy of Waste Elimination**

# DELPHI

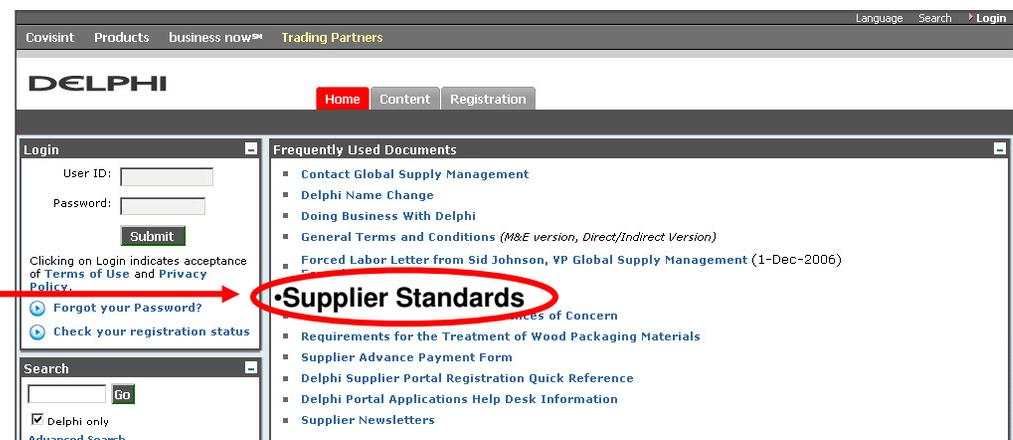
## Accessing Web Resources

www.delphi.com/suppliers

- ◆ Access the Delphi Corporate web site: [www.delphi.com/suppliers](http://www.delphi.com/suppliers)
- ◆ Click on **Supplier Community Portal**



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



- ◆ 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		
	<b>Delphi Global Packaging and Shipping Manual</b> Have a question regarding the Delphi Global Packaging & Shipping Manual? Contact Laura Wenz at <a href="mailto:laura.a.wenz@delphi.com">laura.a.wenz@delphi.com</a> . 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.	 pdf
	<b>Delphi Supplier Packaging Information Form</b> 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.	 xls

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## Inbound Packaging Contacts

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Sr. Inbound Packaging Engineer

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# Questions and Answers

If you have additional questions regarding VEGA 2 after the training session, please contact the Delphi Electronics & Safety VEGA Support Team:  
**[delco.vega.support.kokomo@delphi.com](mailto:delco.vega.support.kokomo@delphi.com)**

