

NA Supplier Packaging Standards

<< Returnable Packaging >>

3-31-15

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Section 1: Goals & Objectives

Goal:

Outline the Returnable Packaging requirements for production parts shipped to DENSO North American Group Companies and to define the required communication timeline for packaging development and approval

Objective:

- A. Ensure Safety
- B. Guarantee Part Quality
- C. Approved Packaging is available to support mass production
- D. Packaging Standardization
- E. Clearly Identified Returnable Packaging Cleaning Expectations
- F. Identify Expendable Backup Packaging Requirements
- G. Minimize Packaging, Transportation and Logistics Costs
- H. Minimize our Landfill bound waste

Note:

In addition to standard DENSO supplier packaging guidelines, each DENSO plant location may have its own unique requirements that must be followed. Supplier is responsible to check the appendix for specific DENSO plant requirements.

Section 2: Packaging Development and Quoting Timeline

		RFQ & Selection Process							Packaging Confirmation Process							Mass Production Confirmation Process															
Action, N = 1 month		Responsible	N-24	N-23	N-22	N-21	N-20	N-19	N-18	N-17	N-16	N-15	N-14	N-13	N-12	N-11	N-10	N-9	N-8	N-7	N-6	N-5	N-4	N-3	N-2	N-1	N	N+1	N+2	N+3	
1	RFQ Package Sent to Supplier(s) Including Pkg Guide and or Specific Requirements	Purch	Pre Selection Activity																												
2	Suppliers return RFQ along with Completed Packaging spec and estimated packaging cost	Supplier	Pre Selection Activity																												
3	RFQ Package(s) Reviewed and Clarified 1. Pricing at or below target price 2. Packaging meets NA Standards	Puch/PKG/S QE/PDE					Pre Selection Activity																								
4	Tranportation Costs Estimated 1. Based on provided packaging spec from each supplier	NAIL/ NA Purch						Pre Selection Activity																							
5	Supplier Selection Made 1. Piece Price 2. Qaulity 3. Packaging Cost 4. Transportation Cost 5. Inhouse Logistics Cost (Repacking)	Purch/BP							Approval Steps																						
6	Request Sample Packaging	PC/PKG									Samples & Changes																				
7	Packaging Sample Review w/ parts	PC/PKG											Pkg Review Process																		
8	Internal DENSO review	Related Depart													Pkg Review Process																
9	Changes Requested if required	PKG/Purch													Samples & Changes																
10	Final Sample Review and approval	Related Depart														Approval Steps															
11	Confirm Packaging at High volume trials	Related Dept																			Pkg Review Process										
12	Mass Production Review: 1. Palletization Method 2. Box Fill Ratio	PC/PKG																												Pkg Review Process	

Section 3: Supplier Responsibilities:

1. Submit Preliminary Packaging Specification and Preliminary Packaging Cost Estimates along with Purchasing-required RFQ paperwork.
2. Establish a packaging communication contact within supplier's company through which DENSO plant staff will work.
3. DENSO depends upon the supplier to be the expert for the parts being supplied and to deliver a quality part to our manufacturing location(s).
4. Meet the standards contained within the DENSO North American Supplier Packaging Guide unless the specific DENSO plant location requests otherwise or a deviation is authorized by that plant.
5. Submit sample packaging and perform testing when necessary at supplier cost.
6. Utilize approved packaging for mass production, including standard 45x48 pallet.
7. Utilize pallets and boxes that are strong enough to survive the normal delivery route, include full trailer height stacking of pallets.
8. DENSO plant Packaging or Production Control staff will approve the workability of the packaging (size, weight, etc); not part/package quality.
9. If expendable is used only as a back up to returnable packaging, it must be the same size, hold the same number of parts, and perform the same as the returnable packaging.
10. DENSO will not supply returnable packaging for a build ahead or large safety stock carrying at the supplier.
11. If returnable packaging arrives prior to shipment the supplier must repack into it for shipping
12. Notify DENSO of returnable packaging shortages and 24 hrs prior to shipping in expendable packaging

Section 4: Returnable Box Standards

1. Maximum Box Weight Allowed: ≤ 30 lbs / 13.6 kgs
2. Box Fill Requirement: $>85\%$ full by volume, Target = 100%
3. Box Identification:
 - Labels maybe used to identify DENSO Plant and Supplier
 - Hot Stamps maybe used to identify DENSO Plant and Supplier
 - Supplier owned boxes must be marked with supplier name and plant location
 - Some DENSO locations have container codes that may be require to be on the boxes also, check the specific plant requirements
4. Box Selection (if boxes size is not directed by DENSO):
 - Standard Size Injection molded box that cubes a 48 x 45 pallet should be the first option
 - Custom sizes must be approved by DENSO
 - Use of lids is discourage unless needed to insure part quality

Standard Box Sizes:

12 x 7 x 5

12 x 15 x H*

24 x 15 x H

24 x 22 x H

Oversized Boxes:

32 x 15 x H

45 x 16 x 9

45 x 16 x 14

45 x 16 x 20

*Height of box to be determined by part size for best fit

Standard Heights: 4,5,7,9,11,14 inches

Section 4: Returnable Box Standards (continued)

Kanban Card Holder Location:

- On adjacent side of the all boxes when card holder locations are present
- Most 4" and 5" tall standard boxes do not have card holder location on adjacent sides, card holders on opposite sides is allow
- Taping or sticking kanbans/labels onto returnable boxes is not allowed. The supplier will be required to remove them prior to using the tote again

Standard Locations
Adjacent sides



Standard Locations
4" and 5" boxes



No taping or sticking
labels to boxes



Section 5: Returnable Dunnage Standards

1. DENSO plants may instruct the supplier on the style of dunnage to use.
2. Dunnage must protect the parts during the normal storage and transit environment.
3. Dunnage must allow ease of removal of the parts to support production picking.
4. If not explicitly call out on part drawing, supplier is responsible to decide if rust preventive material(s) are needed and should inform DENSO at RFQ timing.
5. Individual parts should not be bagged or wrapped unless request by DENSO
6. Nesting, if applicable, must be done in an orderly method that is maintained during shipping
7. Layering of parts is to be avoided if possible
8. If part is a visible/trim part on car:
 - Class A surface protection materials should be used on areas that may touch the parts

Standard Dunnage Styles May Include:

Bulk in a bag



Cell Packed



Custom Trays



Layer Packed



Section 6: Returnable Pallet & Lid Standards

Standard Pallet Requirements:

1. Standard Size: 48" x 45"
2. Pallets must be 4 way entry
3. Pallets should allow moving by pallet jack
4. Pallets must have a top lip to stop boxes from sliding off
5. Seatbelts for securing loads must be approved by the DENSO Plant
6. Flat bottom pallets should be used for heavy weight product for better weight transfer

Vacuum Formed Mirror Image
(Bottom and top are identical)



Structural Foam Pallet
(Footed Pallets)



Structural Foam Pallet
(Smooth Bottom for heavy weight)



Standard Lid Requirements:

1. Standard Size: 48" x 45"
2. Lids must lock and stop pallet above from sliding
3. Use the lid designed to match/interlock with the selected pallet
4. Lids should have a lip to stop box below from sliding out from under the lid

Section 7: Supplier Packaging Cleaning Expectations:

Standard Expectations:

1. Clean returnable containers. Include removing dirt, water, debris, residue, worn expendable dunnage, etc.. as required.
2. Routine checks should be made and regular cleaning must occur as needed to ensure part quality and cleanliness during the life of the container.
3. Repetitive contamination should be reported to DENSO for corrective action

Special Expectations:

Any special cleaning requirements will be communicated to during the RFQ process.

May Include:

1. Air blow off to remove foreign matter from dunnage for trim(Class A Surface) parts prior to each use
2. Washing of dunnage between uses to remove oil, residue, shavings

Cleaning/Inspection Method Confirmation:

Some DENSO Plants may require the supplier to complete a cleaning/inspection method form to ensure that the supplier is meeting the minimum cleaning requirements. See appendix 1 for an example

Supplier Responsibility:

To inform DENSO at RFQ timing if the supplier believes that a cleaning should be required between each use.

Section 8: System Days Allocation

Standard Allocation methods:

1. DENSO will work with the supplier to determine the correct amount of returnable packaging needed to support standard shipping
2. The following items will be considered to calculate the amount of packaging needed:
 - a. Peak Shipping Volume
 - b. Order Lot Size
 - c. Shipping Frequency
 - d. Travel Time, back and forth
 - e. DENSO desired inventory levels, empty and full
 - f. Supplier standard inventory levels empty and full
 - g. If special cleaning required, inventory for that process
 - h. Expected shrinkage percentage during the life of a program
3. If the supplier requires more packaging for supplier internal requirements. The supplier will be required to purchase the packaging at the suppliers cost

Special Requirements:

1. Any additional returnable packaging needed will be negotiated:
 - a. DENSO required inventory banks
 - b. If the supplier is batch running parts, (weekly, monthly, etc), DENSO will not supply returnable packaging for that part of your inventory. Supplier will be expected to repack into the returnables prior to shipping

Section 9: Backup Expendable Packaging Requirements

General Guidelines:

1. Backup expendable packaging should be used as the last option
2. Supplier should have expendable packaging quickly available incase of a shortage.
3. Supplier must communicate to DENSO Production Control and Packaging 24 hours prior to shipping in expendable packaging. (see plant specific requirements)
4. Expendable packaging should be used for a build-ahead or safety stock above DENSO requirements, DENSO will not provide returnable packaging for supplier internal requirements
5. Review NA Expendable Packaging Requirements for more specific information and review the specific ship to plants Packaging Supplier Guide
6. Contact the plant Packaging/Production Control Group if you have questions

Supplier Responsibility:

1. Design and testing of expendable packaging to ensure part quality is maintained through the DENSO shipping network, the supplier is responsible for expendable packaging failure
2. Box must be the same size as the returnable box outside dimensions
3. Box must hold the same number of parts as the returnable box
4. Dunnage should be as similar as possible to approved returnable dunnage
5. For Class A/Trim Parts, plastic bagging/sheeting maybe required to keep the parts contamination free
6. Box Strength: Boxes must perform the same as the returnable boxes for stacking
7. Box Construction: No staples allowed in boxes or lids (Safety Concerns)
8. Box sizes: Boxes must cube same size pallet at returnable boxes

Section 10: Palletization Standards

Palletizing Requirements:

1. Boxes must always be secured to the pallet.
2. Boxes must cube a 45" x 48" pallet.
3. No overhanging boxes.
4. Maximum pallet height 52 inches to allow double-stacking on trailers.
5. Pallet/Packaging must be double-stackable during transit.
6. Stretch wrap or plastic banding must be used to secure the load to the pallet.
7. No non-transparent stretch wrap allowed.
8. Do not wrap two or more pallets together unless requested by DENSO

Banding Requirements:

1. Only one-half inch ($\frac{1}{2}$ ") polypropylene or polyester banding is allowed.
2. No metal banding allowed, some exceptions are made for raw materials
3. Minimum of two bands always required.

Banding Calculation: (Band Strength/2) x (Number of Bands) = Max Pallet Weight

4. Banding should run parallel to large fork openings

Section 10: Palletization Standards Continued

Stretch Wrap Requirements:

1. Wrap used must be transparent
2. Wrap must prevent the load from sliding off of the pallet base
3. A minimum of two wraps at the base and the top of the pallet should be used
4. Wrap should overlap to secure all boxes from shifting

When to use Stretch Wrap vs Banding?

Stretch Wrap

1. Light to Medium weight pallets (0 to 750 lbs)
2. Pallets with many small to medium sizes boxes that could slide out of place
3. Secure uneven layers/loads

Banding

1. Medium to Heavy Weight pallet (751 & over)
2. Pallets with corrugated pallet bins or sleeves to contain the boxes.
3. Odd shaped items on pallets

Banding & Wrap

1. Air shipments
2. Heavy weight shipments of many small boxes that can not be secured by banding

DENSO Plant Preferred Ordering Methods:

Option 1: Full pallets of identical product (volume and shipment frequency must be considered)

Option 2: Full layer with mixing* allowed

Option 3: By individual box with mixing* allowed

Note: Not all NAGCs allow mixing, supplier is responsible to confirm with specific ship to locations

Section 10: Palletization Standards (continued)

Pallet Stacking Rules:

- 1. Returnable packaging should support stacking and shipping at full trailer height of 104 inches.
- 2. Wooden pallets should not be stacked on top of returnable packaging unless requested by DENSO North American Integrated Logistics (NAIL) or the ship to plant location.
- 3. Returnable packaging should not be stacked on top of expendable packaging.
- 4. Do not wrap or band two or more pallets together unless requested by the ship to plant location.
- 5. Max weight/trailer stack = 2000 lbs unless requested by DENSO NAIL or the ship to plant location. (2000 lbs is only a guide for production shipped via NAIL routes)

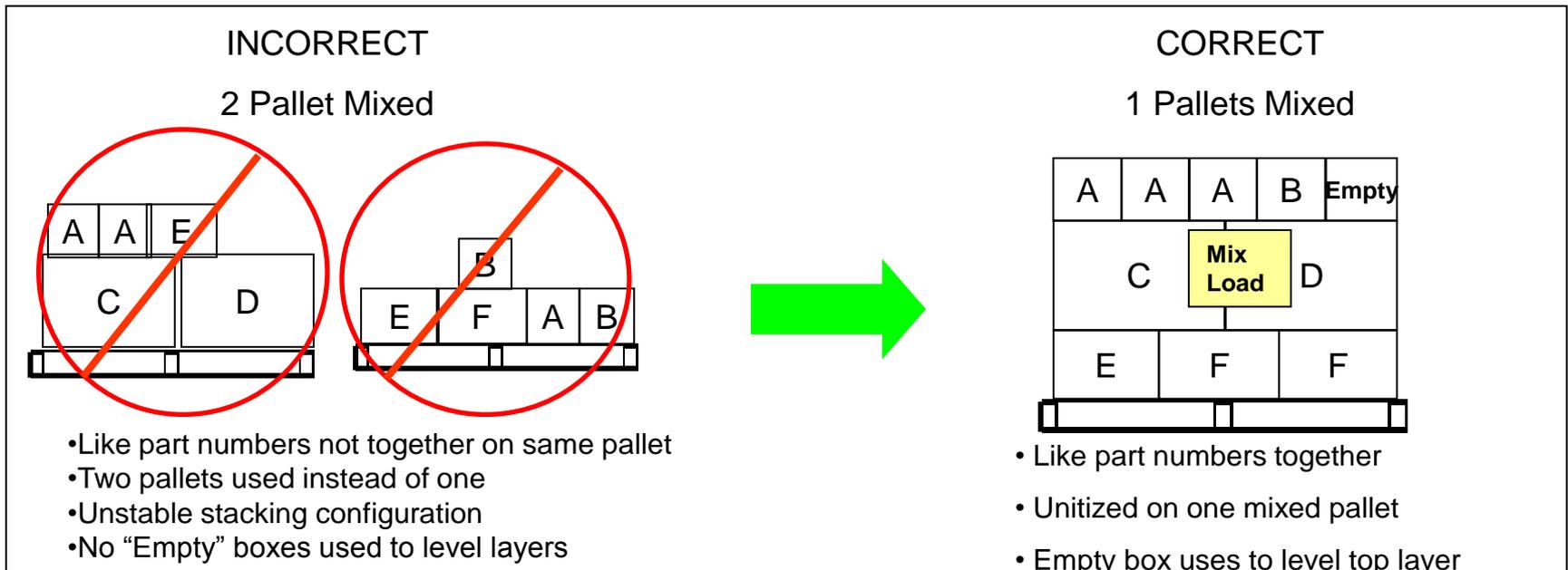
Preferred Pallet Load Sizes	Stacking Height During Transit
45" x 48" x 26"	4 pallets high
45" x 48" x 34"	3 pallets high
45" x 48" x 52"	2 pallets high

Section 10: Palletization: Mix Loading Requirements

Mix Loading Pallet Rules:

1. Mixed parts on a pallet allowed if the product is on the same Delivery Order.
2. “Like” part numbers must be mixed on the same pallet.
3. Filler “Empty” boxes should be used to level off a layer to allow stacking.
4. When an “Empty” boxes is used, it must say “EMPTY” on it.
5. A Mixed Pallet Sheets (2) must be used when shipping a mixed pallet (See Forms -00X)

Example: Pallet Mix Loading



Section 11: Labeling Requirements

Labeling Requirements:

1. DENSO required box kanban/label placed on the narrow end of the box.
2. Box kanban/label must be placed in a pouch or card holder, **do not tape or stick** the labels to the box.
3. When possible, box labels should face the outside of the pallet.
4. If pallet consists of “Mixed Part Numbers”, then 2 mixed pallet labels must be placed on adjacent sides of the pallet (see 2nd picture below).
5. If shipping via NAIL, then two “Skid Sheets” on adjacent sides of the pallet (see 3rd picture below).

Box Label in Card Holder



Mixed Pallet Sheets



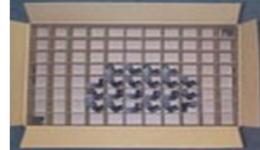
Skid Sheets



Section 12: New Component Packaging Requirements

DENSO may choose to send the supplier specific packaging requirements to quote. The attached form maybe used to communicate those requirements

If the supplier does not feel that the requested packaging will protect the parts, then the supplier should contact the Packaging Contact for review

New Component Packaging Requirements					
NAGC Name(Add your Company Name)					
Component Name:	Washer				
DENSO Part # (s):	TN00011-0000				
Supplier Name(s):	UR Pean				
Part Weight (KGS):	0.005	Part Dimensions in MM:	30x30x5		
1) Desired Dunnage Type → Tray or Insert					
1. Bulk Packed		2. Cell Packed			
 <p>Plastic Bag may be required</p>		 <p>Partition Set Required</p>			
3. Tray or Insert		4. Layer Packed			
 					
2) Specific Requirements					
1. Specific Box quantity or multiple:		60			
2. Estimated Peak Monthly Volume:		20000			
3. Mass Production Start Date:		12/2/2009			
4. Returnable DOH allowed at supplier		7			
5. Special QA Requirements:		Must not scratch flat surface			
6. Packaging Cleaning Requirements:					
3) Returnable or Expendable Container → Expendable					
Expendable- Corrugated box, HSC, HSC w/FF or RSC					
Returnable- Plastic or Metal container					
Standard Requirements					
1. Box must be greater that 80% Full by Volume		3. Standard Pallet Size = 48x45x5, 50" with freight			
2. Max Box Weight = 30lbs, 13.6Kgs		4. Pallets must be double stackable for shipping			
4) Desired Box Dimensions (LxWxH) → 24 x 15 x 5					
If Bulk Bin enter dimensions -					
If other enter box dimensions -					
5) Estimated Parts/Pallet and Pallet Weight				PCS	2880
				LBS	1500
6) Other Special Requirements:					
Approvals					
Completed by:		QA/QC	PE	TIE	
Date:					

Section 13: Packaging Specification

- NA Standard Pkg Specification:
 1. Must be completed by supplier and submitted to Purchasing along with Request for Quote Documents
 2. Location to get latest copy of the NAGCs packaging Specification:
www.densocorp-na.com/suppliers/resources
- 3. Must meet the minimum packaging requirements as described in this Guide:
Summary:
 - A. Box:
 1. Must cube a 45 x 48 pallet
 2. Weight: ≤30 lbs/13.6kgs
 3. Support Pallets Stacking up to 104” by pallet during transport
 - B. Dunnage:
 1. Designed to protect parts during transportation
 2. Allow for easy removal of parts for production
 - C. Pallet:
 1. 4 Way Entry 45 x 48 pallet
 2. Heat Treated Stamp required, if parts are crossing an International Border

NA Standard Pkg Specification (Preliminary Spec)

CO -LOGO		SUPPLIER PACKAGING SPECIFICATION		Fill Ratio A31	QS9000 DOCUMENT TNPC90.001.2	DATE SUBMITTED: June 12, 2014	REVISION: 1																											
PART INFORMATION			SUPPLIER INFORMATION		SPECIFICATION DATA																													
DENSO PART NUMBER:	AA123456-7890		SUPPLIER PART NUMBER:	SPN-12345-A		DENSO DIVISION SHIPPED TO:	DMTN Starter / Alternator																											
PART DESCRIPTION:	Automotive Widget		SUPPLIER NAME:	Auto Parts USA		PROPOSAL STATUS:	Final																											
(ORDERING) UNIT OF MEASURE:	EA		DENSO SUPPLIER CODE:	XY1		COMPLETED BY:	J. Doe																											
DIGITAL PHOTOS																																		
INTERNAL DUNNAGE & PART			CONTAINER / RACK (show label location)		TYPICAL PALLET LOAD (AS SHIPPED)																													
																																		
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;">Fill Ratio:</td> <td style="width: 33%;">Less than 80% Reason Code</td> <td style="width: 33%;">Verification Method</td> </tr> <tr> <td>Fill Ranking</td> <td>1= Over weight</td> <td>5=Prod Requirement</td> </tr> <tr> <td>A = More than 80%</td> <td>2= QA Requirements</td> <td>6= Supplier Request</td> </tr> <tr> <td>B= Less than 80%</td> <td>3= Volume</td> <td>7= Others</td> </tr> <tr> <td>C= Not Checked</td> <td>4=Cust Requirement</td> <td>-- N/A</td> </tr> <tr> <td></td> <td></td> <td>1=Visual Check of Full Box</td> </tr> <tr> <td></td> <td></td> <td>2=by Similar Part</td> </tr> <tr> <td></td> <td></td> <td>3=By Math Data</td> </tr> <tr> <td></td> <td></td> <td>4=Other</td> </tr> </table>								Fill Ratio:	Less than 80% Reason Code	Verification Method	Fill Ranking	1= Over weight	5=Prod Requirement	A = More than 80%	2= QA Requirements	6= Supplier Request	B= Less than 80%	3= Volume	7= Others	C= Not Checked	4=Cust Requirement	-- N/A			1=Visual Check of Full Box			2=by Similar Part			3=By Math Data			4=Other
Fill Ratio:	Less than 80% Reason Code	Verification Method																																
Fill Ranking	1= Over weight	5=Prod Requirement																																
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C= Not Checked	4=Cust Requirement	-- N/A																																
		1=Visual Check of Full Box																																
		2=by Similar Part																																
		3=By Math Data																																
		4=Other																																
DUNNAGE DESCRIPTION:	Poly Bag 18 x 18, 2mil		CONTAINER STYLE:	RSC		PALLET STYLE:	Wood, 4 way entry																											
DUNNAGE MATERIALS:	PE		CONTAINER MATERIALS:	C275		PALLET MATERIALS:	Hardwood & Wrap																											
PACKAGING DATA																																		
PACKAGING TYPE	Expendable					UNITIZATION METHOD:	Stretchwrap																											
DIMENSION INFORMATION (in.)				WEIGHT INFORMATION (lbs.) <small>(assume a full pallet regardless of typical order size)</small>		QUANTITY INFORMATION <small>(assume a full pallet regardless of typical order size)</small>		Packaging Costs																										
[OUTSIDE DIMENSIONS]	LENGTH	WIDTH	DEPTH					Item	Qty/Plt	Cost																								
PART SIZE	1	1	0.12	PART WEIGHT	0.01	PARTS/CONTAINER	1000	Box	36	\$ 1.26																								
CONTAINER / RACK	24	15	7	CONT. w/ DUNNAGE (EMPTY)	1.7	CONTAINERS/LAYER	6	Dunange	36	\$ 0.09																								
				CONTAINER WEIGHT (FULL)	11.7			Pallet	1	\$ 9.34																								
PALLET BASE / CAP	48	45	4.5	PALLET BASE	28	LAYERS/PALLET	6	Wrap/Banding	1	\$ 1.50																								
				PALLET CAP	5			Other 1	1	\$ -																								
PALLET LOAD (AS SHIPPED)	48	45	46.5	PALLET LOAD (AS SHIPPED)	454	CONTAINERS/PALLET	36	Other 2	1	\$ -																								
				PARTS/PALLET	36000	Cost/Pcs		\$ 0.0017																										
Yellow Areas to be completed by DENSO						DENSO APPROVALS:																												
DIVISION SPECIFIC COMMENTS:						Enter department name on top line and approval signature on bottom section.																												
PACKAGING CODE:		ORDER LOT:	1000	STACK HEIGHT:	2	EFFECTIVE:		AIAG INFORMATION:																										

Specification Instructions

1. Supplier Packaging Specification to be submitted along with all other required RFQ documents
2. Packaging Cost fields must be completed at the time of RFQ.
3. No Blank fields allowed
4. DENSO will complete fields in yellow
5. Cells outlined in **RED** are self calculating. Do not type in these fields
6. No fractions allowed 8 1/2, use decimals 8.5
7. All information is in inches, pounds, and US Dollars
8. Like part numbers using the same packaging can be submitted on the “Preliminary” form.
9. Final Specifications must be completed for each part number
10. File Name to be “Supplier Name & DENSO Part Number.xls (ACME AA123456-7890.xls)
11. Comment boxes are indicated by a red triangle in the cell and contain a list of choices or pertinent information to complete that area –Place the cursor over the red triangle and a box will pop up for review
12. Digital Photos, computer drawings, or electronic sketches are acceptable
13. Photo files must be inserted into the document: Choose “Insert”, “Picture”, From File”
14. Do not copy/paste the photos into the document
15. Photo size must be less than 500Kbytes each (*.jpg format is recommended), total SPS must be **2MB or less**
16. Enter part weight, & quantity DATA assuming a full (maximum height) pallet of each part being shipped, or up to 2000lbs/pallet
17. “Fill Ratio” field requires you to estimate the fullness of the box using the Criteria in the Comment box. Any spec with less than 85% full will be rejected
18. If you need to add additional information, please insert a text box at the bottom of the specification.
19. If you have any questions, please contact the packaging person for the plant(s) that you are shipping to (See Section 12)

Please call the Plant you will be shipping to
Packaging and Purchasing Contacts for
specific questions or instructions

Appendix 1: Packaging Cleaning Operation Standards

Example

SUPPLIER PACKAGING CLEANING STANDARD / LINE SIDE VISUAL AID

DENSO PART NAME: <input type="text" value="Core"/>	APPROVALS			
PART NUMBER(S): <input type="text" value="TN01234-5678"/>	DMAT	DATE	SUPPLIER	DATE
TOTE AND DUNNAGE: <input type="text" value="GREEN DENSO TOTE"/>				
DOCUMENT PREPARED BY: <input type="text" value="John Smith"/>				

SUPPLIER MUST INSPECT THE PACKAGING (INCLUDING INTERNAL DUNNAGE IF USED) DUNNAGE BASED ON THE BELOW VISUALS



GOOD / DESIRED

100% cleaning of
all totes each time

MARGINAL /
PASSABLE



NO GOOD /
REJECT

SUPPLIER INSPECTION CRITERIA	SUPPLIER CLEANING METHOD
<p>-Before using tote on line, each and every tote must be cleaned of powder residue built up in dunnage cavity.</p>	<p>-Tote is flipped upside down and tapped and vacuumed to allow powder residue to be removed from tote (Must be completed on every tote before each use)</p> <div style="display: flex; justify-content: space-around;">   </div>