NA Supplier Packaging Standards

<< Expendable Packaging >>

3-8-19

Rev 2

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Section 1: Goals & Objectives

Goal:

Outline the minimum acceptable Expendable 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. Production Efficiency

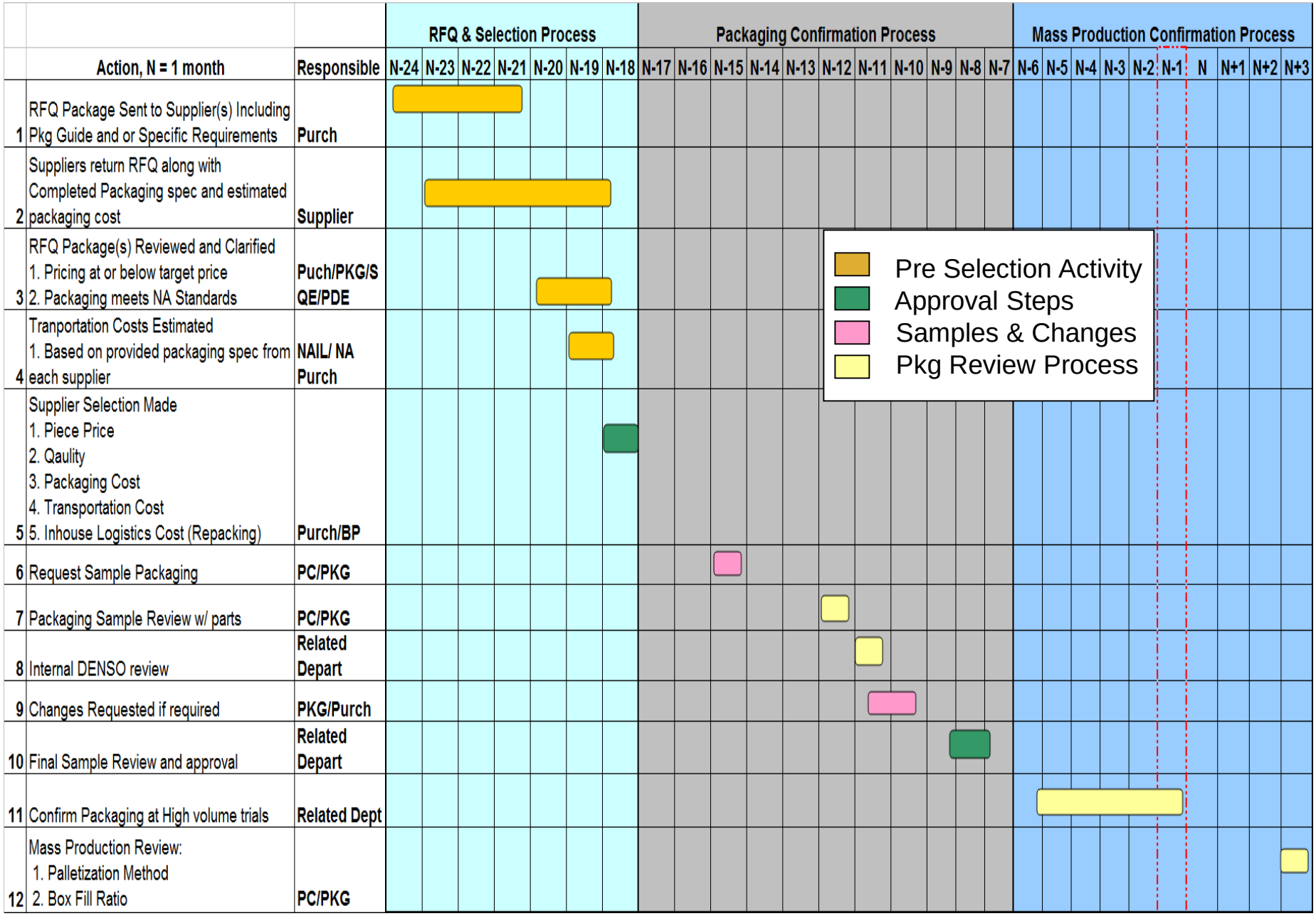
F. Minimize Packaging, Transportation and Logistics Costs

G. 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



Section 3: Supplier Responsibilities:

1. Submit Preliminary Packaging Specification and Preliminary Packaging Cost Estimates along with Purchasing-required RFQ paperwork.
2. Submit new specs for parts that have design changes, lot size changes, or any other packaging changes.
3. Establish a packaging communication contact within supplier's company through which DENSO plant staff will work.
4. 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).
5. 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.
6. Submit sample packaging and perform testing when necessary at supplier cost. Testing may include part evaluation and providing data after pack testing. Test shipments sent to DENSO are to be labeled to the attention of responsible associate.
7. Utilize approved packaging for mass production, including standard 45x48 pallet.
8. Utilize pallets and boxes that are strong enough to survive the normal delivery route, include full trailer height stacking of pallets.
9. DENSO plant Packaging or Production Control staff will approve the workability of the packaging (size, weight, etc); not part/packaging quality.
10. 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.
11. DENSO encourages suppliers to look for packaging improvements including pack efficiency, cubing improvements, part orientation in pack, and cost savings. Submit improvements ideas to DENSO. They will be reviewed and feedback given to the supplier.

Section 4: Expendable Dunnage Standards

1. DENSO plant location may instruct supplier on style of dunnage to use.
2. The supplier is expected to select and/or design the dunnage to protect the parts. Expendable dunnage must mirror returnable dunnage, if applicable.
3. Dunnage must be recyclable.
4. Dunnage must protect the parts during the normal storage and transit environment.
5. Dunnage must allow ease of removal of the parts to support production processing.
6. If not explicitly call out on part drawing, supplier is responsible to decide if rust preventive material(s) are needed and should inform us at RFQ timing.
7. If part is a visible/trim part on car:
   - Class A surface protection materials should be used
   - Dust inhibiting coating should be used on corrugated dividers

Standard Dunnage Styles May Include:

Bulk in a bag

Cell Packed

Custom Trays

Layer Packed

Section 5: Expendable Box Standards

1. Maximum Box Weight Allowed: ≤ 30 lbs / 13.6 kgs
2. Box Fill Requirement: >85% full by volume, Target = 100%
3. No Printing allowed except for:
   - Small Font Box Part Number
   - Box Makers Certification Stamp
   - Country of Origin for parts contained within
4. Box Strength: Boxes must be support pallet stacking for shipping up to full trailer height of 104” and 144” for warehouse storage.
5. Box Construction: No staples allowed in boxes or lids (Safety Concerns)
6. Backup Expendable Boxes:
   - Must be the same size as the returnable box. If lid is on the box the lid must match the outside dimension of the tote to prevent the layer of boxes to from overhanging the pallet.
   - Hold the same number of parts as the returnable box
   - When possible allow parts removal in the same method as the returnable packaging
   - Supplier is required to have back expendable available for immediate use
   - DENSO is not responsible for dead stock or tooling costs for expendable back up packaging
7. Box sizes: Boxes must cube a 45” x 48” standard pallet

Section 5: Expendable Box Standards (continued)

Standard Box Sizes:
12 x 15 x H*
24 x 15 x H
24 x 22 x H

*Height of box to be determined by part size for expendable

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

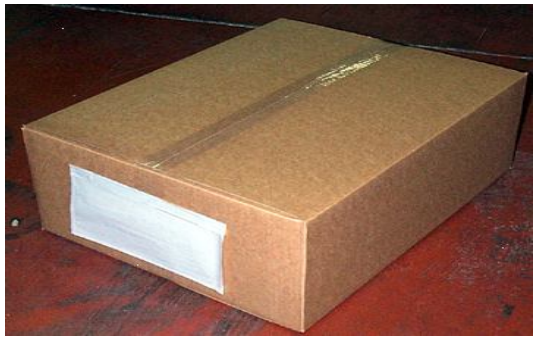
Note: When using a box smaller than 24”x15”, a layer pad or layer lid must be used to add stability to the pallet

Kanban (Label) Location:

- Place kanban on the narrow end of the box.
- Kanban must be placed in a pouch, unsealed perfered
- Taping kanban to box is unacceptable.

Standard Styles:

RSC (Regular Slotted Container)
(not allowed for TAC facilities)



HSC w/lid(Half Slotted Container)

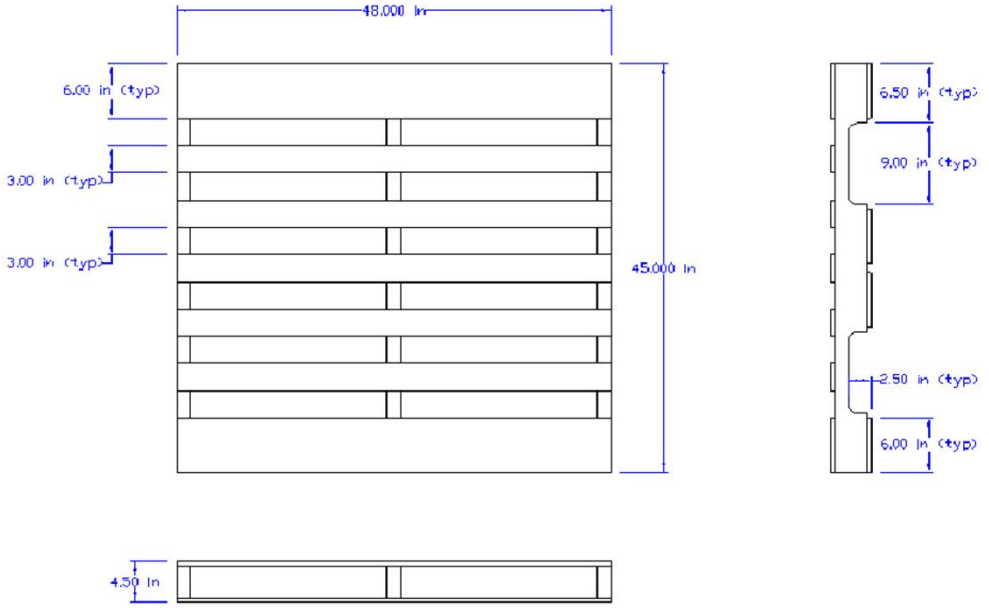
HSC w/2” French Fold
(not allowed for TAC facilities)

Note: Not all locations allow all three box styles

Section 6: Expendable Pallet Standards

Pallet Requirements:

Required Pallet Size: 45” x 48” x 5”. 4 way entry



Bottom Board Importance:

The purpose of the bottom boards is to evenly transfer the weight when the pallets are stacked, if the pallet has less than 15” of wdith combined on the bottom boards, any crushing damage occurring during transit will be charged back to the supplier

Pallet Construction:

STYLE: Notched Stringer (4 way entry)

DECK: 7 boards (.5 thickness), min width 3”

BOTTOM: 4 boards (.5 thickness) min width 3” (Deck board width must add up to 15 or more inches combined)

STRINGERS: 3

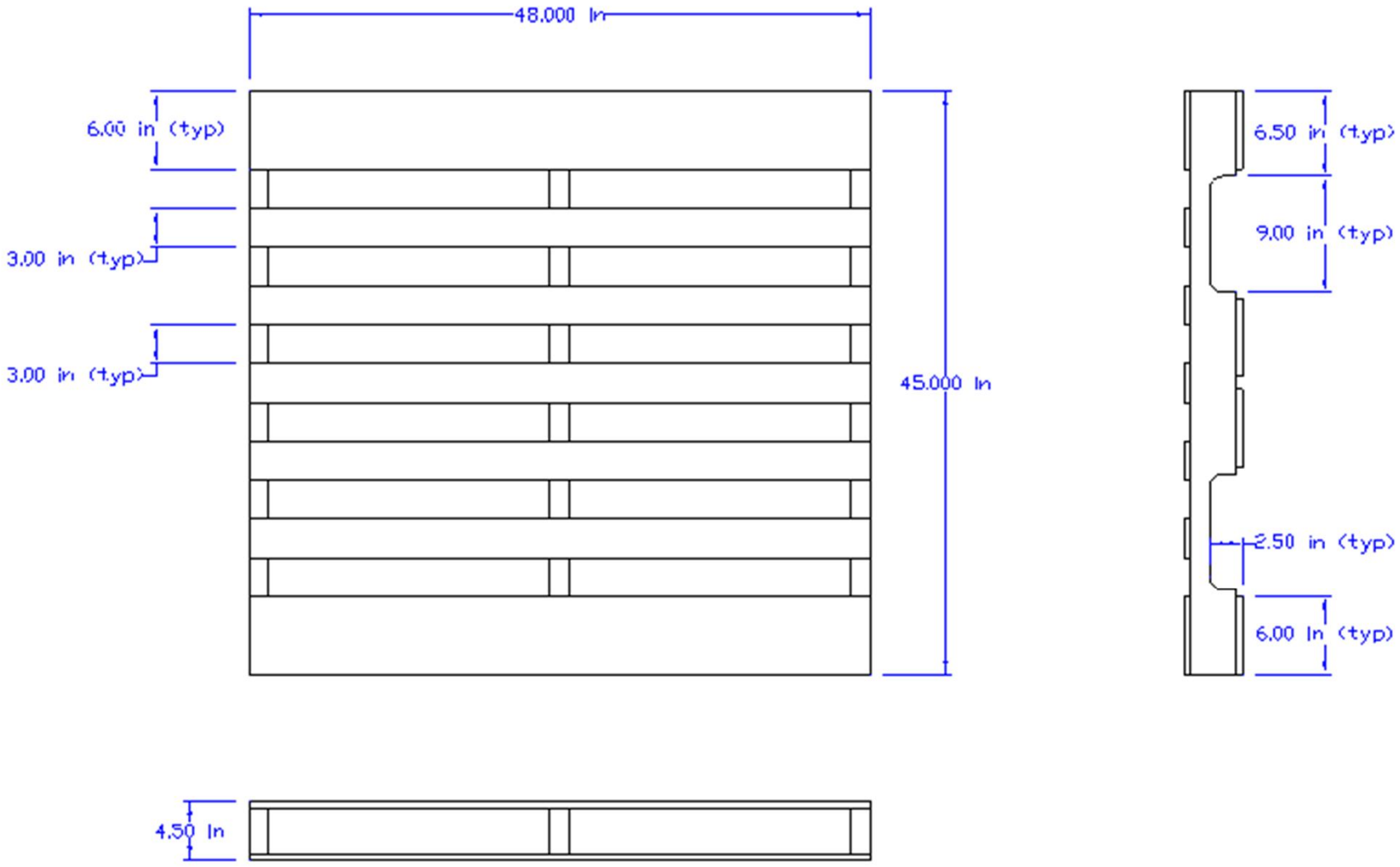
Heat Treated: Required for wooden pallets crossing International Borders.

Heat Treating Requirement links:

https://www.ippc.int/sites/default/files/documents/20131115/ispm_15_2009_en_2013-11-15_2013111509%3A00--504.61%20KB.pdf

http://www.aphis.usda.gov/wps/portal/banner/help?1dmy&urile=wcm%3apath%3a%2Faphis_content_library%2Fsa_our_focus%2Fsa_plant_health%2Fsa_export%2Fsa_wood_packaging%2Fsa_by_country%2Fct_countries_requiring_ispm_15

Bigger Picture of 45 x 48 Pallet



Wing pallets are not allowed at DMMI. Block pallets must be full perimeter.

Section 7: Palletization Standards

Palletizing Requirements:

1. Boxes must always be secured to the pallet.
2. Boxes must cube a 45” x 48” pallet.
3. Box corners should be supported by deck boards, if not a base pad should be used.
4. No overhanging boxes.
5. Maximum pallet height 52 inches to allow double-stacking on trailers.
6. Pallet must be double-stackable during transit.
7. Stretch wrap or plastic banding must be used to secure the load to the pallet.
8. Stretch wrap must be secured to the pallet.
9. No non-transparent stretch wrap allowed.
10. For boxes smaller than 24x15”, layer pads should be used to make the load stable
11. Vertical corner post should be considered if it will help keep the load stable.

Banding Requirements:

1. Only one-half inch (½”) polypropylene or polyester banding is allowed.
   (red tie bands are allowed at TAC facilities)
2. No metal banding allowed.
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
5. Banding should not be run through 4 way entry notches
6. Edge protectors should be used to protect the top boxes from being crushed

Section 7: 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 responsible to confirm with specific ship to locations

Section 7: Palletization Standards (continued)

Pallet Stacking Rules:

1. Expendable packaging support stacking and shipping at full trailer height of 104 inches.
2. Expendable packaging must support stacking 144” in a warehouse.
3. 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.
4. Returnable packaging should not be stacked on top of expendable packaging.
5. Do not wrap or band two or more pallets together unless requested by the ship to plant location.
6. 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 8: Mix Loading Requirements

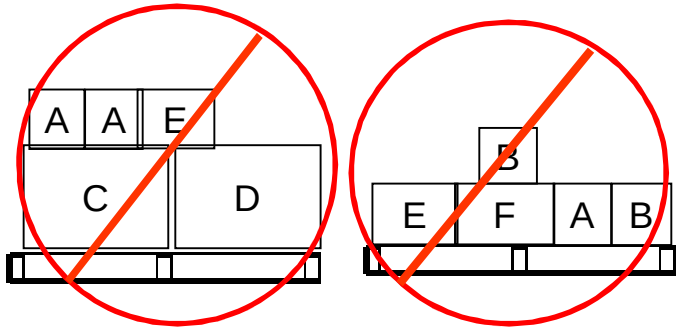
Mix Loading Pallet Rules:

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. Mixed Pallet Sheets (2) must be used when shipping a mixed pallet (See Forms -00X)

Example: Pallet Mix Loading

INCORRECT

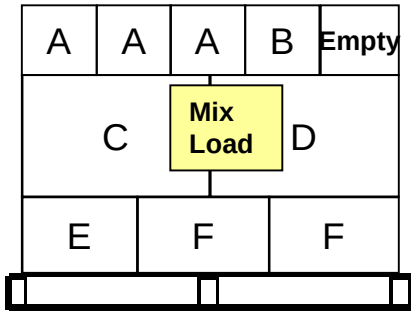
2 Pallet Mixed



•Like part numbers not together on same pallet
•Two pallets used instead of one
•Unstable stacking configuration
•No “Empty” boxes used to level layers

CORRECT

1 Pallets Mixed



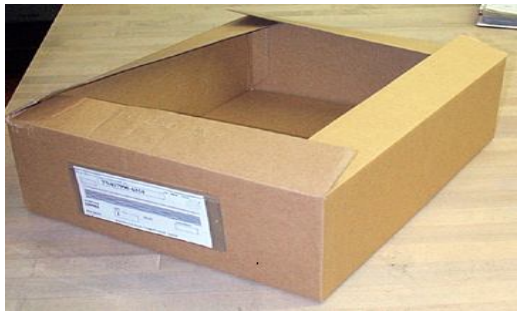
• Like part numbers together
• Unitized on one mixed pallet
• Empty box uses to level top layer

Section 9: 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, **do not tape** the label to the box.
3. 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).
4. If shipping via NAIL, then two “Skid Sheets” on adjacent sides of the pallet (see 3rd picture below).

Box Label in Pouch



Mixed Pallet Sheets

Skid Sheets

Section 10: 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

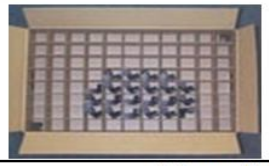
If the supplier does not feel that the requested packaging will protect the parts, then the supplier should contact the Packaging Contact for review

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
 Plastic Bag may be required	 Partition Set Required
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 sratch 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 11: Packaging Specification

- NA Standard Pkg Specification:

  1. Must be completed by supplier and submitted to Purchasing along with Request for Quote Documents

- 1a. For TAC suppliers are to complete the packaging specification form in NAIL. This input should be completed 24 weeks prior to mass production start up. Once completed suppliers are to email TAC PCE to notify the spec is completed. TAC PCE will review and if OK will route internally for approvals.

- 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	QS9000 DOCUMENT TNPC90.001.2	DATE SUBMITTED:	June 12, 2014
		A31		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)

Fill Ratio:

Fill Ranking	Less than 80% Reason Code		Verification Method
A = More then 80%	1= Over weight	5=Prod Requirment	1=Visual Check of Full Box
B= Less than 80%	2= QA Requirements	6= Supplier Request	2=by Similar Part
C= Not Checked	3= Volume	7= Others	3=By Math Data
	4=Cust Requirement	-= N/A	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.) (assume a full pallet regardless of typical order size)		QUANTITY INFORMATION (assume a full pallet regardless of typical order size)		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:		

Revision 3: 6/2014

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 me less than 500Kbytes each (*.jpg format is recommended), total SPS must me 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: TAC Packaging and Lot Size Change Guidelines

Responsibility:

A. TAC Production Control Engineering (PCE):

- Investigate all proposals for lot size changes from internal departments and suppliers.
- Request updated packaging specifications be input into NAIL.
- Inform departments of packing or lot size change

B. TAC Material Control (MC) and Production Material Planner (PMP):

- Material Control will investigate current inventory.
- MC and / or PMP coordinate timing of change over with supplier, customer and internal departments, as applicable, and establish effective dates.
- MC or PMP to add effective date CIGMA P40 screen.

C. Supplier:

- Propose new lot size, if asked, by checking what will fit into the packaging.
- Update the packaging spec in NAIL and notify TAC PCE group.
- Coordinate with material control on the timing of the change over.
- Start shipping to meet new lot size or packaging on the established effective date.

Appendix 2: TAC Supplier Service Part Packaging Guidelines

Unless otherwise specified supplier service part packaging must be expendable and must be packed in an appropriate size box to insure the quality of the part(s).

Responsibilities:

1. TAC Production Control Engineering (PCE):

- Provide supplier with DMMI requirements.
- Review suppliers packaging specifications for component parts (as needed).

2. Supplier:

- Review and adhere to TAC requirements.
- Monitor packaging condition and ensure quality of pack before use.
- Investigate packaging improvements.
- Provide packaging cost analysis to TAC Purchasing, when requested.
- Suppliers are to follow DENSO Supplier Manual regarding expendable packaging.
- Submit sample packs and perform package testing when necessary.
- Parts must utilize at least 85% of the pack without exceeding 30 lbs.
- Utilize TAC standard wood pallets (48” x 45”)