



Lenovo OEM/ODM Packaging Requirements

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REVISION HISTORY

Rev	Revision Description	Date	Approved by
A0	Creation	02SEP2009	Speed Liu
A1	Update Packaging security seal	18MAY2010	Sarah Yu
A2	1. Change 2.1.2.1 from Corrugate paper to Paper 2. Update minimum of 50% post-consumer fiber content on Page 6 3. Define material recyclability on Page 6 4. Highlight "Styrofoam foam (EPS) is prohibited in Lenovo" on page 7 All above updates are in blue	17APR2012	Karen Lee
A3	1. Add IdeaPad carton spec. on page 12 2. Add IdeaPad packaging requirement into non-palletized shipment on page 17	16MAY2012	Royal Bai/Karen Lee
A4	1. Revise material description on page 7 2. Update the document linkage on page 7 3. Obsolete the usage of memory security seal (41A0501) on page 10	14NOV2013	Royal Bai

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1.0 Introduction

The purpose of this booklet is to show a general packaging guidelines and requirements to lenovo OEM/ODM suppliers. It outlines the details on packaging material selection/test procedure/packaging labeling/palletization and keeps the consistency for each manufacture site globally.

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2.0 General Requirements

2.1 Overall Requirement

2.1.1 Lenovo Green Strategy

Lenovo uses a comprehensive waste management system to reduce the impact of our waste materials on the solid waste stream. This integrated system emphasizes source reduction and recycling programs prior to investigating alternatives for disposal.

Material recycling strategies will focus upon the use of:

1. Recycled material(s) in our packaging.
2. Other materials which provide a resource for secondary applications (e.g., recyclable materials).
3. Reduce the packaging materials consumption continuously
4. Spread the Returnable packaging solution to the specific customer

100% post-consumer content materials are chosen for packaging design as 1st priority and continue to offer the most environmental friendly packaging in the field. For examples, the Thermoform cushion with the 100% recycled RLDPE and molded fiber with the 100% recycled paper fiber.

The details, please refer to lenovo engineering specification 41A0613 – “Recyclable Packaging Materials Selection and Identification”

2.1.2 Packaging Material Requirement

2.1.2.1 Paper

The packaging category covers two major types of paper: "**containerboard**" used to make corrugated shipping containers, and "**paperboard**," used in a wide variety of packaging applications such as folding cartons, "blister cards," beverage carriers, book and report covers, mailing tubes, and video cassette boxes.

Containerboard (corrugated board) is actually a composite paperboard made by sandwiching fluted "corrugating medium" in between layers of linerboard. Linerboard, made primarily from both virgin and recovered fiber from old corrugated containers (OCC), is used to make the inner and outer walls of a box. The inside, fluted "medium" layer in the middle is made almost exclusively from postconsumer recovered fiber from OCC, old newspapers (ONP), used office paper, and mixed papers.

Paperboard containing recovered fiber is a multi-ply material, formed in layers of recovered fiber. Often grey in appearance, a white top layer made from recovered office paper is often used to provide a clean printing surface. Paperboard mills use more recovered fiber than any other segment of the paper industry to manufacture a wide variety of product packaging (folding

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cartons), beverage carriers, mailing tubes, industrial paperboard (cores, drums, tubes, and cans), and many other items.

Lenovo has a generic specification on the property of corrugated container (box) as below and generally Single-wall box is used as a container of Notebook/Options and Double-wall box is chosen as a container of desktop/server/workstation/palletization protection.

Single Wall			Double Wall		
ECT (lb./inch)	ECT (kN/m)	Mullen (lb./in ²)	ECT (lb./inch)	ECT (kN/m)	Mullen (lb./in ²)
32	5.60	200			
40	7.00	250			
44	7.71	275	48	8.41	275
55	9.63	350	51	8.93	350
			61	10.68	400
			71	12.43	500
			82	14.36	600

Guidelines for Recycled Fiber Content

Corrugated container (box) packaging should be manufactured using a **minimum of 50%** post-consumer fiber content using the maximum available post consumer material where adequate supplies exist without compromising needed performance.

The Kraft liner made of 100% virgin wood fiber is required as Think system level packaging and the FSC certified kraft liner is strongly recommended.

Paperboard packaging should contain a **minimum of 45%** post-consumer fiber and 100% recovered fiber. The FSC certified paperboard is strongly recommended.

2.1.2.2 Cushioning Material

In addition to specifying the use of easily recyclable materials, Lenovo Corporation promotes recycling through its purchase of products that contain recycled materials. To assist in achieving this objective, Lenovo requires that plastic packaging must be manufactured using the maximum possible post consumer recycled resin. This requirement is contingent upon several factors, including the existence of processes that produce equivalent performing materials. The percentage of post consumer content technically achievable depends on the chemistry of the material utilized, the performance requirements of its end use application, and the availability of usable post consumer recycled feed stocks.

Recyclability is a metric to identify the material's green level. The entry level is recyclable (baseline) and the packaging can be recycled by the municipal recycling (waste management) process when it is delivered to the end customer. The greener level is recycled and applying the recycled content material like PCC to the product packaging before delivering to the end customer. The greenest level is compostable (Per ASTM D-6400, compostable plastic - a plastic

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that undergoes degradation by biological processes during composting to yield CO₂, water, inorganic compounds, and biomass at a rate consistent). Lenovo encourages the use of compostable/max recycled content packaging materials and the baseline is recyclable.

- Thermoform (RLDPE)
- Molded Fiber
- Compostable Material
- Expanded Polythene
- Molded Foam
- Corrugated cushion

Note: It is Lenovo's Environmental objective to prohibit use of Styrofoam (EPS) in Lenovo products.

2.1.2.3 Pallet (Low-profile Pallet)

Lenovo is glad to spread the standard size pallet and tries to avoid the application of non-standard size pallet in use. The recognized standard pallet size is as shown. Lenovo claims to apply the low-profile pallet to the palletized shipment.

- The metric standard pallet: 1200 x 1000 x 112 mm (Appr. Weight: 14kg)

Due to the consideration of pest free and export requirement, the 1st material choice on pallet is plywood. The solid wood pallet is only selected as the inbound shipment.

All the pallets used for lenovo packaged products must pass the relative test of EIPS 2003 (ASTM D1185).

2.1.2.4 Packaging Materials, Environmental Requirement

The detail, please refer to lenovo engineering specification 41A0612 – “Packaging Materials, Environmental Requirement” or learn it through the following http://www.lenovo.com/global_procurement/us/en/Guidelines/41A0612.pdf

2.2 Packaging Test Requirements

All the packaging tests must comply with the following specifications and procedures strictly

- C-H 1-9711-005 (Packaged Lenovo Products, Testing for Shipment)
- C-S 1-3600-002 (Product Fragility and Packaging Tests)
- C-P 1-9711-008 (Minimum Shock Resistance Levels) found

An abstract on packaging drop test and the details, please refer to the engineering document mentioned above. The packaging test report should be submitted to the responsible packaging engineer in lenovo for approval.

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Mass (Packaged Product)			Number of Shocks (Drops)	Typical Design Drop Height**					
Class	kg	lbs*		Boxed Without Pallet		Palletized		Minimum Pack (No Box)	
	Above - Including	Above - Including		mm	in*	mm	in*	mm	in*
Manual	0-10	0-23	10	900	36	600	24		
Manual	10-30	23-67	10	760	30	450	18		
Manual	30-40	67-89	10	600	24	450	18		
Manual									
Manual	40-60	89-133	(1 bottom) 5 (4 sides)			450	18		
			(2 bottom) 12 (10 bottom)			300	12		
Non-manual	60-90	133-199	(1 bottom) 5 (4 sides)	450	18				
			(2 bottom) 12 (10 bottom)	300	12			300	12
Non-manual	90-120	199-265	(2 bottom) 12 (10 bottom)			300	12	250	10
						100	4	50	2
Non-manual	120-240	265-530	(2 bottom) 12 (10 bottom)			200	8	150	6
						50	2	25	1
Non-manual	240-450	530-993	(2 bottom) 12 (10 bottom)			150	6	100	4
						50	2	25	1
Non-manual	450 - Above	993 - Above	(2 bottom) 12 (10 bottom)			100	4	75	3
						50	2	25	1

Note: The test specimen can be used for one round test only. For example, the repeated packaging test with the same specimen is not acceptable.

Exception: Lenovo China commercial products and IdeaCentre shipped to India follow the below test criteria.

Mass (Packaged Product) kg	Drop Height (mm)
≤15	1000
15—30	800
30—40	600
40—45	500
45—50	400
≥50	300

2.3 Packaging Security Requirements

Lenovo requires the usage of specific tape and labels to properly secure product. It is very important for Lenovo to maintain authenticity and overall security from tampering throughout

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Lenovo's entire supply chain, manufacturing to final destination. The below instruction is an abstract of lenovo engineering specification 41A0636 "Packaging Security Label Requirements".

2.3.1 Packaging Security Seal Summary

Seal Type	Part Number	Description
Labels	41A0506	Security seal for Option (tuck style box) and palletization
	41A0508	Carton Reseal label for RSC style
	41A0509	System Unit Poly Bag Seal. All system bags must be sealed with this label.
	63Y0875	Security seal for FOL style Box
Tapes	63Y0832	Think Tape, 50 meters long (by hand)
	63Y0833	Think Tape, 500 meters long (by machine)
	45K0324	Clear, Unprinted, 50 meters long, for reseal only

2.3.2 Security Seal Application Short Guideline

This section provides guidance on the application of Lenovo security tape and seals. Package Engineering should provide tick marks in their packaging component designs to outline placement of Lenovo security tape and seals to aid manufacturing.

2.3.2.1 Standard RSC Carton Sealing Instructions

Use the Lenovo PP tape P/N 63Y0832 (Manual Taping) or 63Y0833 (Machine Taping) to seal the carton (top and bottom).

Note:

- (1) Align the tape at the center of the carton box.
- (2) Don't wrinkle the tape.
- (3) The min. length on the side face is 5 cm for Single-wall box and 10 cm for double-wall box



2.3.2.2 Standard RSC Carton Repacking Instructions

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In case the original Lenovo PP tape (P/N 63Y0832 or 63Y0833) is cut and the original carton is reused, reseal the carton box with the clear PP tape (P/N 45K0324) on top of the original Lenovo PP tape (63Y0832 or 63Y0833), then affix the security seal (P/N 41A0508). **Use of 41A0508 is mandatory for repacking.**

1. Use the clear, unprinted PP tape (P/N 45K0324) to reseal the carton.
2. Affix the security seal (P/N 41A0508) at the center of the top side of the carton as shown in the picture below.

Note:

- (1) Replace the existing carton with a new one if the carton has been damaged.
- (2) Acceptable number of times a carton can be opened is twice. In other words, if the carton already has two security seals (P/N 41A0508) the carton must be replaced.
- (3) The overlap of the security seal (P/N 41A0508) for the second application must not exceed 1mm.
- (4) If the system needs to take out from the plastic bag, the plastic bag and seal must be replaced.



Clear, unprinted tape over previous taping



41A0508 over opening

2.3.2.3 Tuck Carton Sealing Instructions

This section applies to small tuck cartons that were too small to be RSCs. This would include most peripherals (accessories/options) and FRUs (If the item is in an RSC then refer to section 3.1). Use the standard security label 41A0506 over all openings of the carton.

Note:

- (1) All carton openings must be sealed. Package Engineering should have provided tick marks for placement locations.
- (2) Use the padlock on the label as a guide for placement if Package Engineering did not specify a location with tick marks. The padlock image should go over the opening since there are no security slits in this area.
- (3) Label must be applied firmly to flat surfaces without wrinkles. Do NOT place over “thumb-holes”
- (4) Packaging Engineer should choose a carton style that has only one opening to limit the usage of Lenovo security labels and to limit opportunities of theft or other unwanted openings.

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Ideal location if there is no thumb-hole and on either side of the thumb-hole is acceptable

2.3.2.4 Tuck Carton Repacking Instructions

In case the original Lenovo security seal (P/N 41A0506) is cut and the original carton is reused, reseal the carton with an additional security seal (P/N 41A0506). **Use of 41A0506 is mandatory for repacking.**

1. Use the PP security seal (P/N 41A0506) to reseal the carton.
2. Affix the security seal (P/N 41A0506) over the previous seal.

Note:

- (1) Replace the existing carton with a new one if the carton has been damaged.
- (2) Acceptable number of times a carton can be opened is twice. In other words, if the carton already has two security seals (P/N 41A0506) the carton must be replaced.
- (3) The overlap of the security seals (P/N 41A0506) for the second application must not exceed 1mm.

2.4 First Article Requirement

All the packaging samples must be in compliance with Lenovo spec. and any new localized packaging samples must be submitted to Lenovo packaging engineer for approval. In parallel, the local engineer should inspect the samples and send out an FAI report to the responsible packaging engineer in lenovo. The fully packaged production sample should be submitted at least 2 weeks prior to SVT.

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3.0 Corrugated Container (Box) Requirement

3.1 Incoming packaging for Shell/C-items (component level)

For the shell/C-items shipped to lenovo manufacture site, the below table shows the carton specification and how to select a correct carton box by weight.

Type	Burst Strength	ECT	Max.Weight
Single Wall	200 psi	32	< 30 lbs
Double Wall	230 psi	42	between 30 lbs and 65 lbs
Double Wall	275 psi	48	between 65 lbs and 80 lbs

Note: The returnable carton box is unaccepted.

3.2 System packaging (F/Gs level)

Option:	Single-wall, Burst strength 200 psi/ECT 32
ThinkPad:	Single-wall, Burst strength 275 psi/ECT 44
IdeaPad:	Single-wall, Burst strength 200 psi/ECT 33
Desktop (Think brand):	Double-wall, Burst strength 275 psi/ECT 48
Desktop (Idea brand):	Double-wall, Burst strength 230 psi/ECT 48
WorkStation:	Double-wall, Burst strength 275 psi/ECT 48
Server:	Double-wall, Burst strength 275 psi/ECT 48

Note: The Kraft liner made of 100% virgin wood fiber is required as Think system level packaging and the FSC certified kraft is strongly recommended.

Single Wall			Double Wall		
ECT (lb./inch)	ECT (kN/m)	Mullen (lb./in ²)	ECT (lb./inch)	ECT (kN/m)	Mullen (lb./in ²)
32	5.60	200			
40	7.00	250			
44	7.71	275	48	8.41	275
55	9.63	350	51	8.93	350
			61	10.68	400
			71	12.43	500
			82	14.36	600

3.3 Shipping packaging (shipment level)

The corrugated paper used for shipment should include the shipping carton, top/bottom cover and sleeve (tube). Per lenovo palletization requirement "Best of Breed", lenovo chooses a power pack palletization method and need a pallet stack/Rack.

Shipping carton (NB):	Single-wall, Burst strength 200 psi/ECT 32
Shipping carton (DT):	Double-wall, Burst strength 230 psi/ECT 38
Sleeve (tube):	Double-wall, Burst strength 275 psi/ECT 48

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4.0 Cushioning Material Requirement

4.1 Cushioning material selection

Generally, 100% post-consumer material is lenovo's 1st choice in the scope of packaging test qualification. MSDS (Material Safety Data Sheet) and RoHS compliance reports are necessary and need to be submitted to lenovo responsible engineer.

- Thermoform (RLDPE)
- Molded Fiber
- Compostable Material
- Expanded Polythene
- Molded Foam
- Corrugated cushion

4.2 Exceptions

In an initial phase of SIT/SVT build, lenovo can accept the OEM/ODM to prepare the fabricated cushion design because of the low tooling cost and short lead time. Between the passing phase of SVT and SOVP, a formal cushioning design is requested and it will be used as a long-term packaging solution. The former fabricated cushion design (EPE) will be in a backup position accordingly.

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5.0 Pallet Requirement

5.1 Material

Please follow the requirement from ISPM-15 and lenovo recommends to apply the plywood pallet for lenovo business shipment. Not only the consistency of lenovo branded products, but also the consideration of oversea shipment. All manufactured wood packaging (MWPM) must be marked regardless of origin or destination. MWPM becomes immune to infestation as it is created and therefore does not require secondary treatments. Plywood is within the scope.

URL: <http://www.ippc.int/IPP/En/ispm.htm> (Click on ISPM-15) and the reference lenovo engineering document is 41A0609 "Wooden Packaging "

5.2 Structure

Lenovo claims the application of low-profile pallet and .the low-profile pallet can achieve an obvious freight cost/palletization density.

5.3 Test Requirement

Follow the test criteria of EIPS (Electronics Industry Pallet Specification) 2003

The Basic Test Requirement.

- Static loading: 1800 kg
- Conveyor loading: 500 kg
- Racking: the max deformation is 6 mm in height.
- Corner drop test: 12 drops at 1m and max. deformation of 1.5%

An abstract from EIPS 2003 for test and the details, please refer to EIPS 2003.

Requirement	1.0m x 1.2m	0.8m x 1.2m
a. Durability Rating (PDS score if used)	25 or more	25 or more
b. Corner Drop per ASTM D1185	12 drops at 1m (40"), Maximum Diagonal Deformation of 1.5%	12 drops at 1m (40"), Maximum Diagonal Deformation of 1.5%
c. Tine Tip Impacts on Block or Stringer Ends per ASTM D1185	3 impacts at 30 cm (12"), no failures	3 impacts at 30 cm (12"), no failures
d. Tine Heel Impacts on Lead Edges per ASTM D1185	3 impacts at 120 cm (48"), no failures	3 impacts at 120 cm (48"), no failures
Notes: 1. The suggested load for all strength tests is corrugated boxes (400x600mm) to fill out the pallet completely and stacked 5 layers high. Dead loads may be used for the stack test. 2. The "European Pool Pallet" (i.e. "Euro Pallet", 0.8x1.2m) meets the physical performance requirements of this specification and may be used whenever an EIPS-2 pallet of that size is specified. However, additional treatments may be required if intending to use these pallets for exports.		

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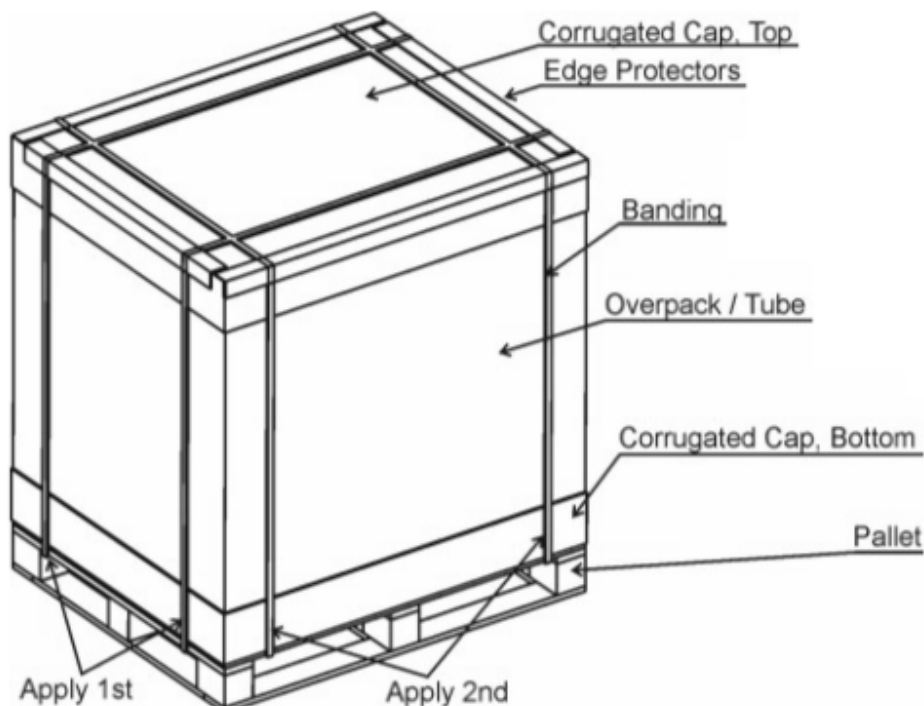
6.0 Shipment Requirement

Please follow lenovo Shipping Package operation Guideline from GSC global logistic team

6.1 Palletized Shipment

6.1.1 Palletized method for Notebook/Option

Lenovo claims the application of power pack for palletization. For Notebook, the corrugated top/bottom covers (caps) /corrugated sleeve are necessary as below shown.



Required Materials

QUANTITY	DESCRIPTION
1	Pallet
2	Corrugated Cap
1	Sleeve (Tube)
4	Edge Protectors
4	Banding
4	Banding Clip
2	Pallet Labels
-	Stretch-Wrap

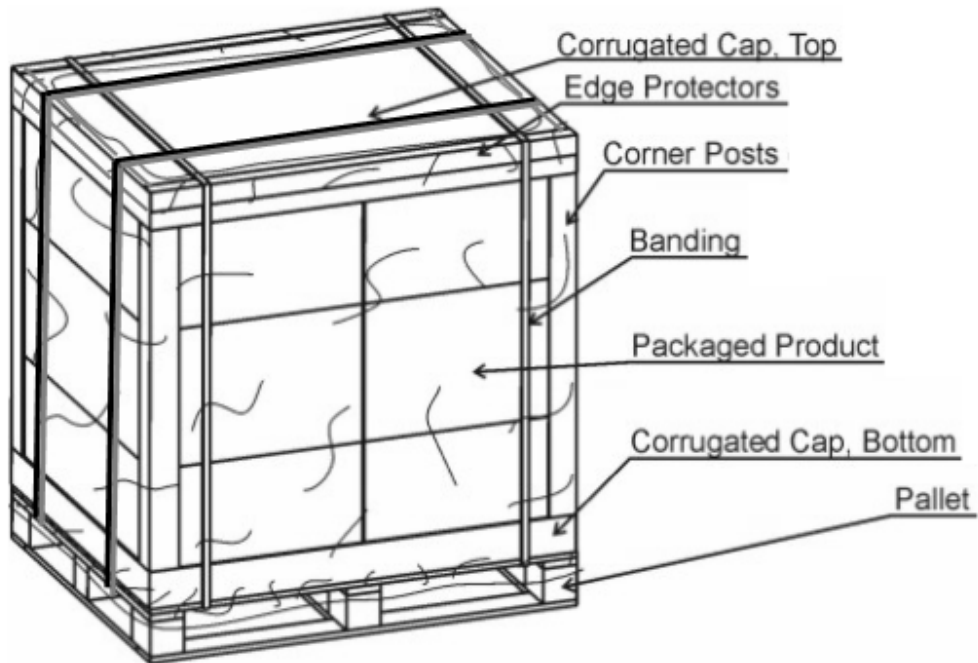
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6.1.2 Palletized method for Desktop/Workstation/Server

For Desktop/Workstation/Server, the corrugated top/bottom covers (caps) /vertical corner posts are necessary as below shown.



Required Materials

QUANTITY	DESCRIPTION
1	Pallet
2	Corrugated Cap
4	Vertical Corner Posts
4	Edge Protectors
4	Banding
4	Banding Clip
2	Pallet Labels
-	Stretch-Wrap

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6.2 Non-palletized Shipment

6.2.1 ThinkPad

For Japan and Latin America models, all the shipments must apply the overpack carton to enhance the protection and security.

For the other regions, the shipment will use the loose carton when the qty is less than 4 pcs and an 4-in-1 overpack carton is necessary for the shipment beyond 4pcs of system cartons.

6.2.2 IdeaPad

For 10" and 10" below laptop, 5-in-1 or 6-in-1 multipack carton is necessary for all GEO shipments.

For 10" above laptop, 2-in-1 or 1-in-1 overpack carton is necessary for China, Japan and Latin America shipments.

Note: Both multipack and overpack cartons should be double-wall.

6.2.3 Desktop/Workstation/Server

For Japan and Latin America models, all the shipments must apply the overpack carton to enhance the protection and security.

For the other regions, the shipment will use the loose carton.

6.2.4 Option

For small size Option, the multi-pack carton is necessary.

The details, please refer to lenovo engineering specification 41A0614 "General Pallet Unitization Requirements "Best of Breed""

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